2016 Annual Environmental Health Report

Protecting People from Environmental Hazards and Disease

Released June, 2017

Lyda Krewson
Mayor

Melba R. Moore, MS, CPHA
Acting Director/Commissioner of Health

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2016 Annual Environmental Health Report

This report overviews regulated environmental health issues within the City of St. Louis. Data and information from this report were retrieved from various databases used by the City of St. Louis Department of Health including CityWorks, HealthSpace, and Chameleon. The Missouri Department of Health and Senior Services, Centers for Disease Control and Prevention, Environmental Protection Agency, East-West Council of Governments and the World Health Organization were used for additional content.

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TABLE OF CONTENTS

Released June 2017

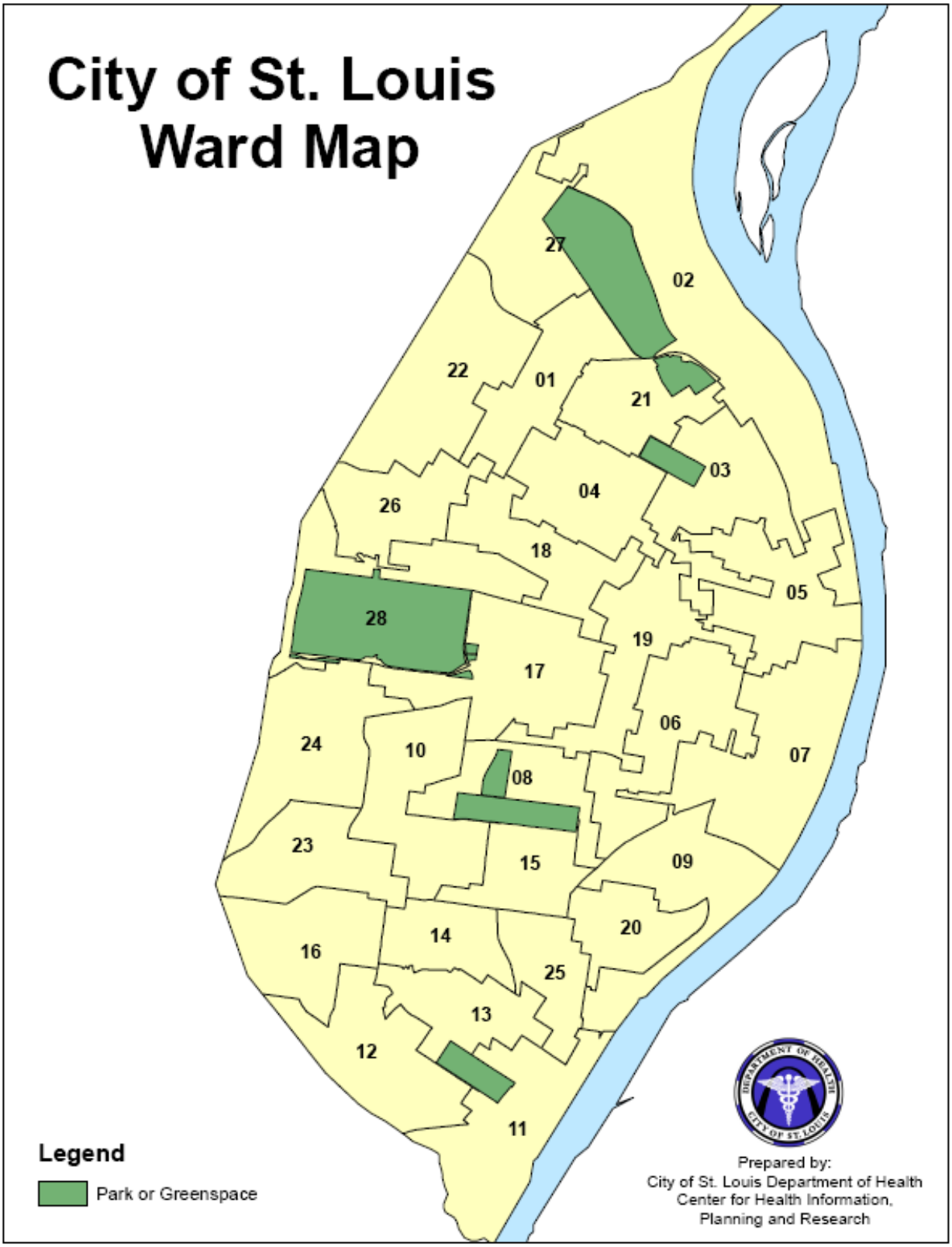
Message from the Director of Health

The City of St. Louis Department of Health's Bureau of Environmental Health Services (EHS) strives to assure a healthy community through quality public health services and partnerships by providing continuous protection, prevention, and promotion for the public's health. EHS is organized into six sections: Food & Beverage Control, Animal Care & Control, Community Sanitation, Air Pollution Control, Vector Control, and Emergency Preparedness.

This report looks at the regulated environmental health issues in the City of St. Louis. These threats to public health must be monitored to assure our citizens of a healthy environment. This is achieved by caring, qualified, culturally-competent Department of Health (DOH) employees who are responsive and proactive to community needs. We work closely with the Citizens' Service Bureau (CSB) to address the public's concerns about environmental risks to animal and human health.

Melba R. Moore, MS, CPHA
Acting Director/Commissioner of Health

This is a City of St. Louis Ward Map to use as a reference for the various maps throughout this report.



FOOD AND BEVERAGE CONTROL

Overview

Ensuring food establishments store, prepare, cook and serve food in a safe and sanitary manner is imperative to protecting the public from foodborne germs and illnesses. Approximately 1 out of 6 Americans become ill after ingesting food contaminated with germs. Food safety continues to be a challenge due to continuous changes in food production, increase in imported food, emergence of antibiotic resistant bacteria, and changes in the environment. Our food takes many steps to get from where it is produced to where it is served or eaten and contamination can happen at any step during the process. The Centers for Disease Control and Prevention (CDC) estimates that while *E. coli* infections have decreased by about 50% since 1997, *Salmonella* infection has not declined in 15 years. Both *E. coli* and *Salmonella* are two common causes of foodborne illness. Federal, State and Local regulations are in place to keep the public safe. Failure to follow regulations can result in fines, legal action, or even worse, foodborne illness and increases in medical costs.

What We Do

The Food & Beverage Control section is responsible for verifying that all food establishments follow well-recognized procedures to provide safe and wholesome food to the public. The DOH adopted and enforces the 2009 Food & Drug Administration (FDA) Food Code. This includes all operations that provide food to the general public, such as restaurants, taverns, carry-outs, grocery stores, caterers, and child care centers. Both permanent and temporary operations are regulated.

Food inspectors routinely inspect all food establishments. The frequency of regular inspections depends on the complexity of the operation. The number of inspections is determined by the risk rating of a facility. Risk ratings are calculated by responses to 10 questions. Questions involve whether the facility serves potentially hazardous foods (PHFs), offers a buffet, cools and reheats PHFs, and whether a critical population is served (children or elderly). A facility can be high, medium or low risk. For example, a gas station that sells pre-packaged food would be inspected less often than a restaurant serving a complex menu of easily perishable items. High risk facilities are inspected every 120 days (4 months), medium risk every 180 days (6 months) and low risk annually (12 months).

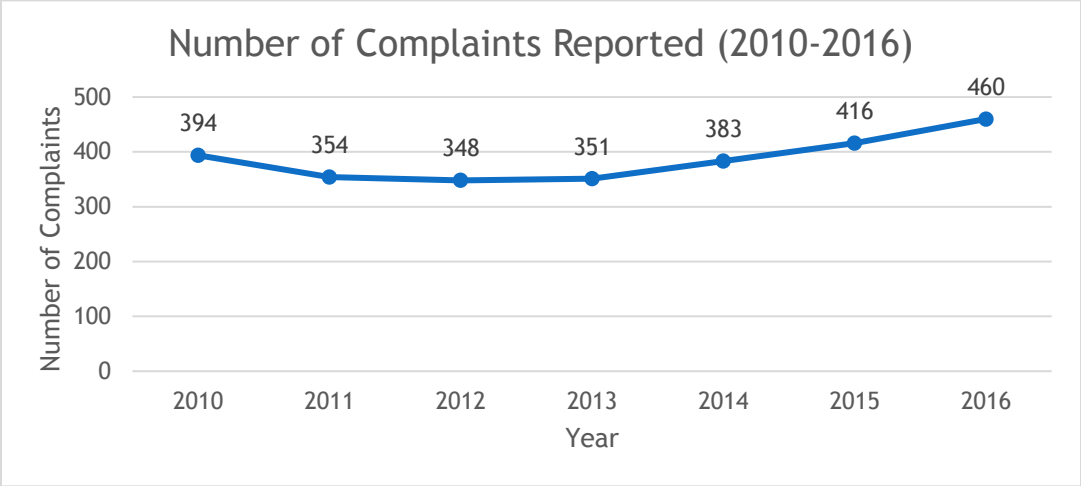
Additional inspections are done when a permanent food establishment opens up, or when complaints are reported to the Citizens' Service Bureau (CSB). If problems are found, follow-up inspections are done to ensure compliance with regulations.

Whenever a temporary operation is set up, such as a food stand at a public event, food inspectors verify compliance before food is allowed to be served.

During an inspection, problems are identified and reported, and the food establishment is given a list of problems to be addressed. Some problems can be fixed before the inspector leaves the establishment. Others take more time, and the inspector returns to verify the problems have been resolved. This results in a second inspection report, which generally finds that problems have been resolved. If not, then subsequent inspections will occur until all problems are resolved. If the food establishment is unable to resolve problems, then various fines and sanctions can be imposed. In extreme cases, food operations may be shut down until problems are resolved.

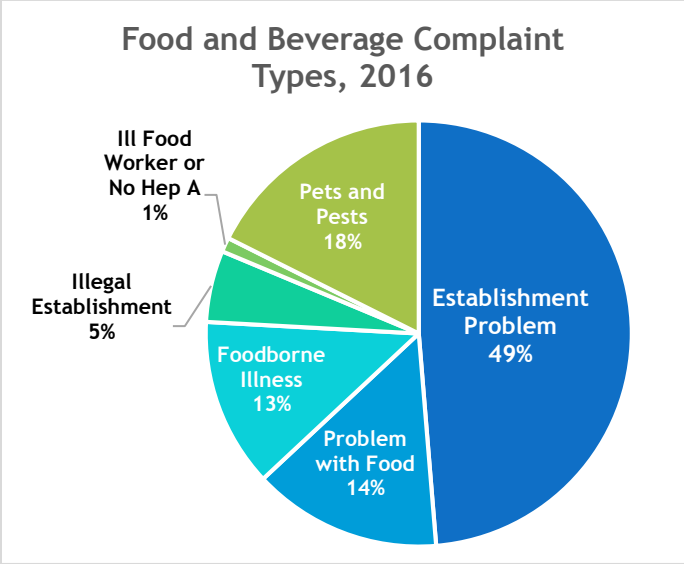
Accomplishments

In 2016, Food & Beverage control inspectors responded to 460 complaints. The number of complaints has risen (32%) in the past five years. Some of this increase is due to the increase in foodborne illness complaints.



Complaints for Food & Beverage Control were separated into 6 Categories:

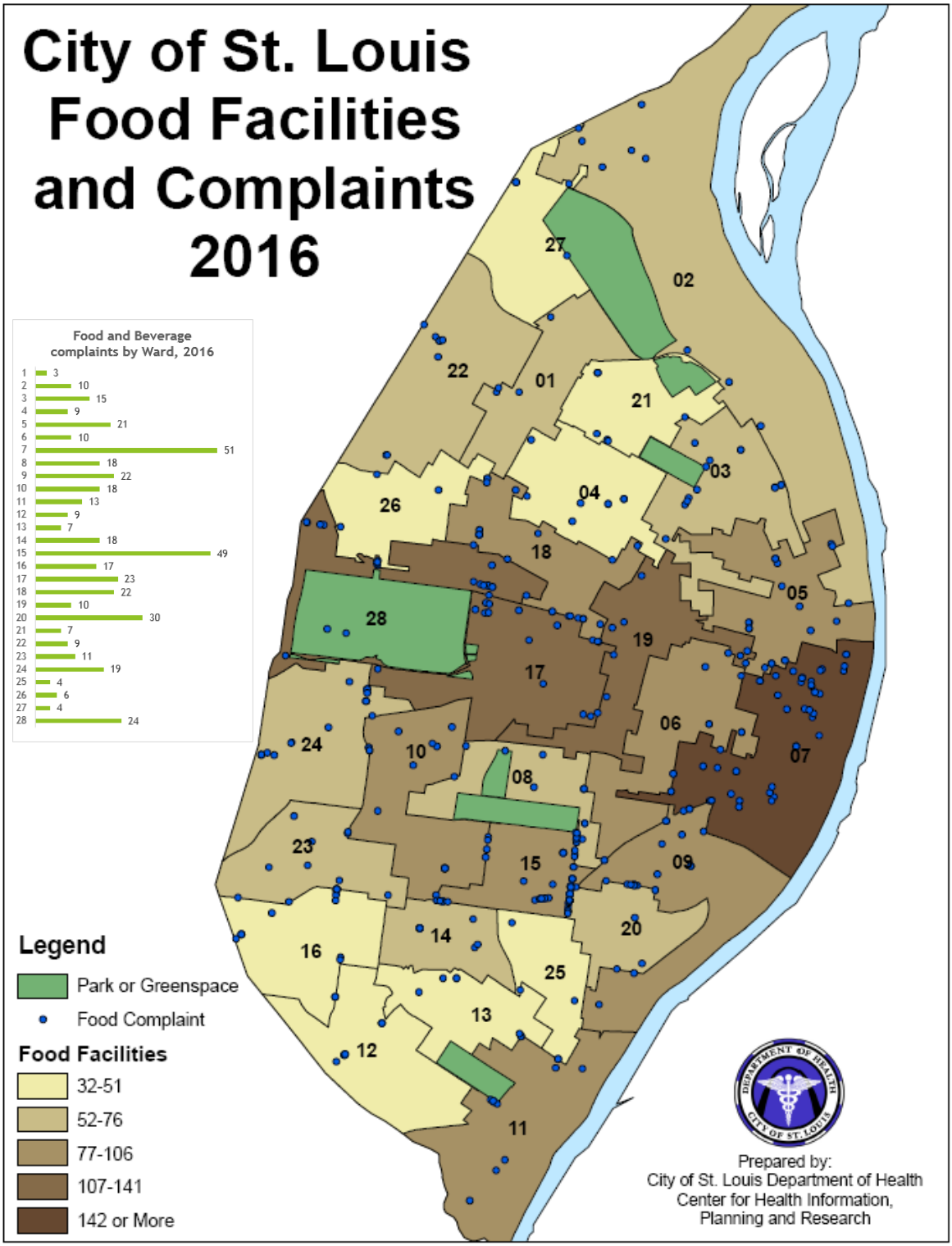
1. Food Establishment Problem
2. Problem with Food
3. Foodborne Illness
4. Illegal Establishment
5. Ill Food Worker or a Food worker without proper Hepatitis A vaccination
6. Pets and Pests (including birds, pets in restaurant, rats, mice and insects)



49% of the complaints received were because of a Food Establishment Problem. Problems generally had to do with unsanitary conditions in the facility.

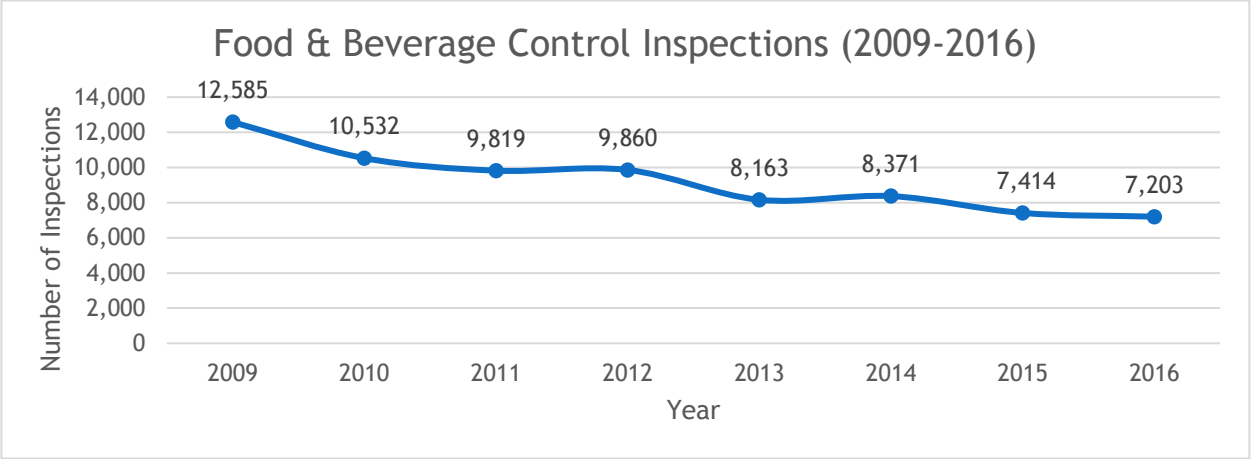
During 2016, only 17% of complaints to Food & Beverage were confirmed. 48% of complaints received were closed as unable to confirm a violation. Food & Beverage complaints are challenging to confirm because they are time sensitive. Once an inspector responds to the location, the food problem or establishment condition in question may have been corrected.

Food and Beverage complaints are spread out throughout the city; however, in 2016, Wards 7, 15 and 20 received the most complaints. The central corridor of the city, including ward 7, has the wards with the most food facilities. This area includes the Central West End, a portion of the Delmar Loop, and Downtown St. Louis City.



Inspections

In 2016, Food & Beverage Control conducted 7,203 inspections, issued 284 permits for new establishments, and renewed 2,058 permits for existing establishments. There were 3% fewer inspections in 2016, which can be attributed to a 3% reduction in food establishments from 2015. In 2011, internal policies updated the inspection frequency from a quarterly schedule to a risk-based (high/medium/low) frequency. Additionally, in 2012, the food inspectors adopted new technology to track complaints, inspections, permits, and billing details.



Grades

Based on City Food Code, Ordinance #68597, a point system is used for grading establishments, whereby points are deducted for each violation found. Violations are ranked as critical or non-critical. Critical violations imply a more severe public health consequence. Critical violations include violations involving potentially hazardous foods, time and temperature requirements, good employee hygienic practices, and lack of adequate handwashing facilities.

A score of 100 is given when there are no violations found during the inspection. Scores are summarized into a general health grade for each inspection.

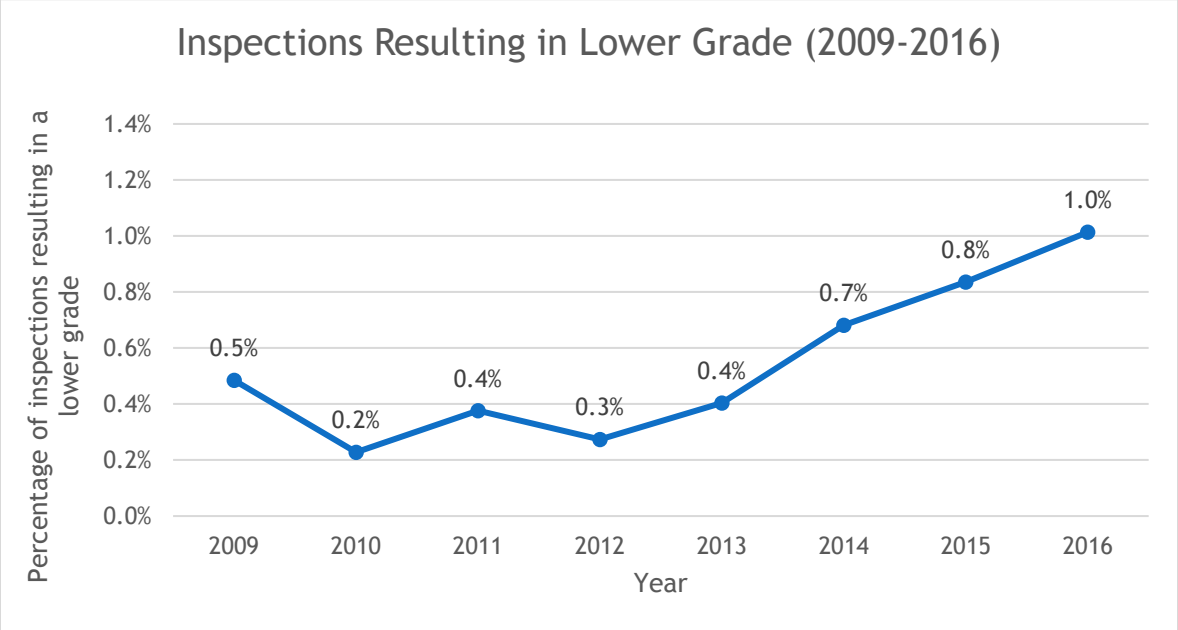
- Grade A is for scores 85-100
- Grade B is for scores 71-85
- Grade C is for scores under 71

Critical violations generally accrue a higher number of points. When three or more critical violations occur during an inspection, the Grade is dropped to “B” or “C”. Operations that are given a “B” grade must improve within a relatively short time to avoid further sanctions. Often, downgraded establishments decide to suspend operations until they can regain their “A” rating. Operations with a “C” grade must improve immediately to avoid permanent closure. With “C” ratings, the DOH may insist operations be suspended until problems are resolved. Once ready to open, suspended operations must reapply for a new permit.

In 2016, out of the 7,203 inspections conducted, 73 inspections resulted in a lower grade (about 1% of inspections). In more meaningful terms, about 1 out of 100 inspections last year resulted in a lower grade. Compared with previous years, 2016 saw the highest ratio of

inspections resulting in a lower grade. Inspectors routinely give verbal advice and education through "teachable moments", resulting in a small number of downgraded facilities.

Year	# Total Inspections	# Inspections resulting in a lowered grade	% Inspections resulting in a lowered grade
2009	12,585	61	0.5%
2010	10,532	24	0.2%
2011	9,819	37	0.4%
2012	9,860	27	0.3%
2013	8,163	33	0.4%
2014	8,371	57	0.7%
2015	7,414	62	0.8%
2016	7,203	73	1.0%



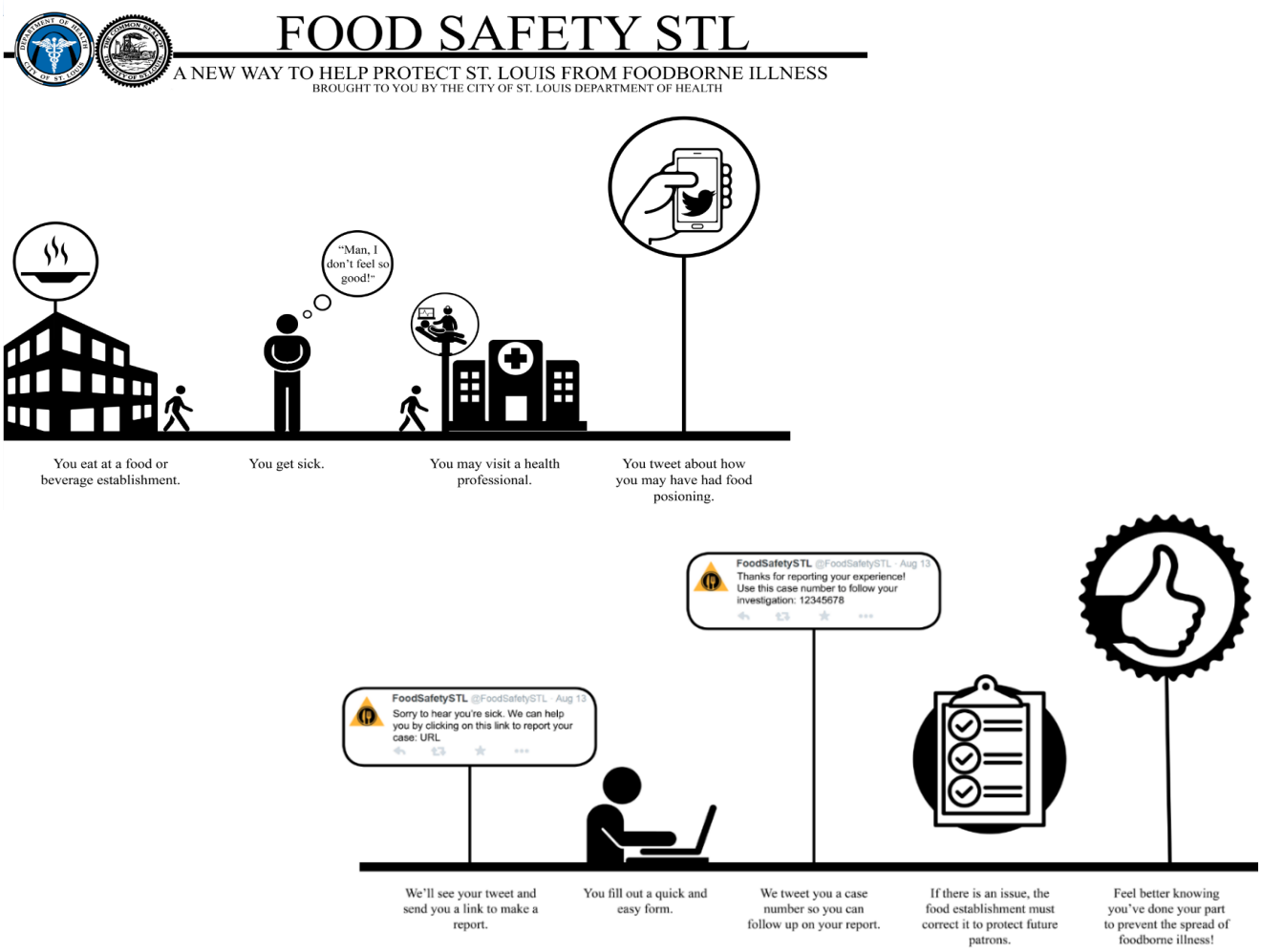
Foodborne Illness

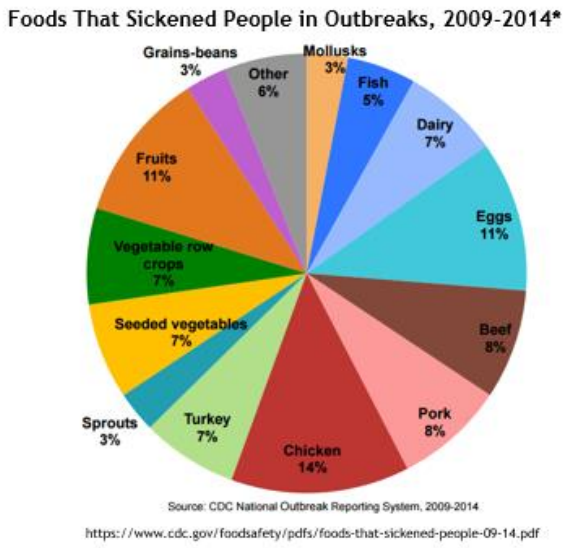
A safe food supply leads to longer and healthier lives, less burden on the healthcare system, and consumer confidence in the food safety system. Foodborne illness, also known as food poisoning, occurs when an individual becomes sick after consuming contaminated foods or beverages. Young children and the elderly are more susceptible to serious conditions and hospitalizations from infections originating from contaminated foods. Preventing foodborne illnesses is a challenge in the food industry. The Food & Beverage Control section of the DOH works hard to investigate complaints of food problems, foodborne illnesses, and illegal establishments. Food inspectors routinely check for safe-food handling certifications and will often observe the food preparation process. As part of normal procedure, each complaint is investigated: the complainants are interviewed for specific incident details and the establishments are inspected thoroughly. Inspectors did not confirm any links between reported illnesses and particular food items or the food establishments.

The Centers for Disease Control and Prevention reports as few as 2.9% of those who become sick with foodborne illness seek medical care and most do not report their illness.

Foodborne illness complaints can be reported through the Citizen's Service Bureau (CSB) via phone, online submission, or direct tweet to CSB (@stlcsb). Residents and visitors can also report foodborne illness through the DOH website; however, new media and information channels, such as social media and search engines, are promising sources of data for improving disease surveillance and reporting.

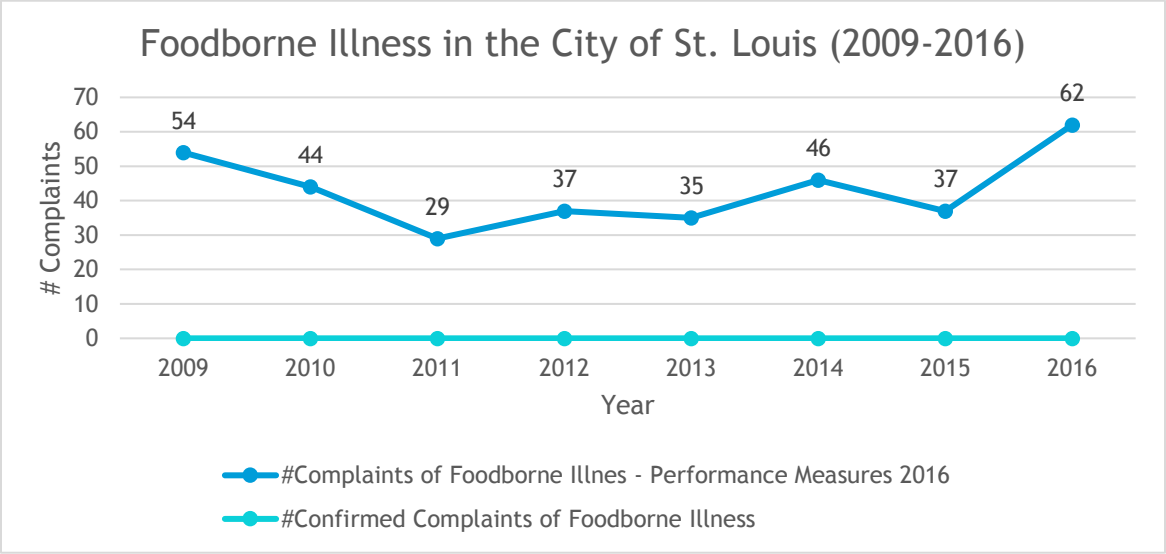
In 2015, the City of St. Louis Department of Health adopted new surveillance technology aimed at detecting and responding to suspected cases of foodborne illness in the community through the use of Twitter. Called "Food Safety STL," the surveillance tool captures tweets that use keywords related to foodborne illness located within a 50-mile radius from the center of the City of St. Louis. These captured tweets prompt a response link from the DOH's Food Safety STL Twitter account (@FoodSafetySTL) to invite the Twitter user to provide further information on reporting. After a report has been submitted, the individual will receive either a follow-up reply tweet and/or email providing him/her with a case number. Complaints that fall outside of this jurisdiction get appropriately referred to the corresponding local health department and the state health department.





The Food Safety STL initiative utilized the expertise from the City of St. Louis Department of Health, Washington University in St. Louis, HealthMap at Boston Children's Hospital, and the Chicago Department of Public Health to improve foodborne illness surveillance and reporting by identifying and responding to foodborne illness tweets on Twitter. This project hoped to increase the number of foodborne illness complaints. In addition, staff hoped to see an increase in the number of foodborne illness complaints where a violation was noted.

Between October, 2015 and May, 2016, the Food Safety STL Dashboard received 442 tweets, 193 of which received a reply. Out of the 193 that received a reply, only 13 foodborne illness reports were made and only 5 were within the City of St. Louis jurisdiction and all 5 received an inspection. 2 of these inspections resulted in no violations, 1 had critical and non-critical violations and 2 had non-critical violations only. In 2015, there were 37 complaints from the public for foodborne illness. In 2016, 62 complaints for foodborne illness were received. This is the highest number of foodborne illness complaints received within the last 7 years.



The Food Safety STL Dashboard encouraged interaction with residents on foodborne illness issues and increased the perceived transparency and trust of the City of St. Louis Department of Health. Residents and visitors were also educated on the foodborne illness reporting process.

COMMUNITY SANITATION

Overview

Sanitation is a cornerstone of public health. Lack of sanitation can cause transmission of bacteria, viruses, and parasites to humans and the contamination of water, soil, and food can accelerate the spread of diseases. Sanitation in a community setting refers to the means of promoting health through enforcement of hygiene practices, wastewater disposal, and hazardous waste removal. Decreases in infectious and communicable illness can be partially attributed to community sanitation. Today, although community sanitation has improved by leaps and bounds, certain conditions and chronic diseases such as asthma, cancer, and vector-borne illnesses are caused or exacerbated by poor sanitation. Emerging and re-emerging infectious diseases can also be transmitted because of poor sanitation. Adequate sanitation, good hygiene and property maintenance, and water supply are essential for public health, urban growth, and economic development.

What We Do

The Community Sanitation section strives to ensure the residents of the City of St. Louis have a safe and sanitary environment. The section protects public health by responding to citizen complaints. Complaint types cover interior and exterior issues pertaining to pests, refuse accumulation, access to heat and running water, hazardous waste, smoking in prohibited places and odors. Community Sanitation also enforces codes in the following areas: inspecting for general sanitation, child care facilities, lodging facilities, recreational water facilities, and tattoo and massage facilities.

The Community Sanitation section enforces certain state laws and local ordinances. The Environmental Health Officers (EHOs) have backgrounds in the sciences including chemistry, physics, biology, microbiology, environmental health, and public health. Inspections are conducted routinely in the following areas:

- Community Events
- Child Care Facilities
- Lodging Establishments
- Recreational Water Facilities

Community Sanitation works closely with the Citizens' Service Bureau and other City departments (Building Division, Water Division, Forestry Division, Refuse Division, Land Reutilization Authority) to investigate and mitigate public health threats. The EHOs respond to complaints received through the Citizens' Service Bureau, a call center that funnels citizen complaints to the appropriate agency.

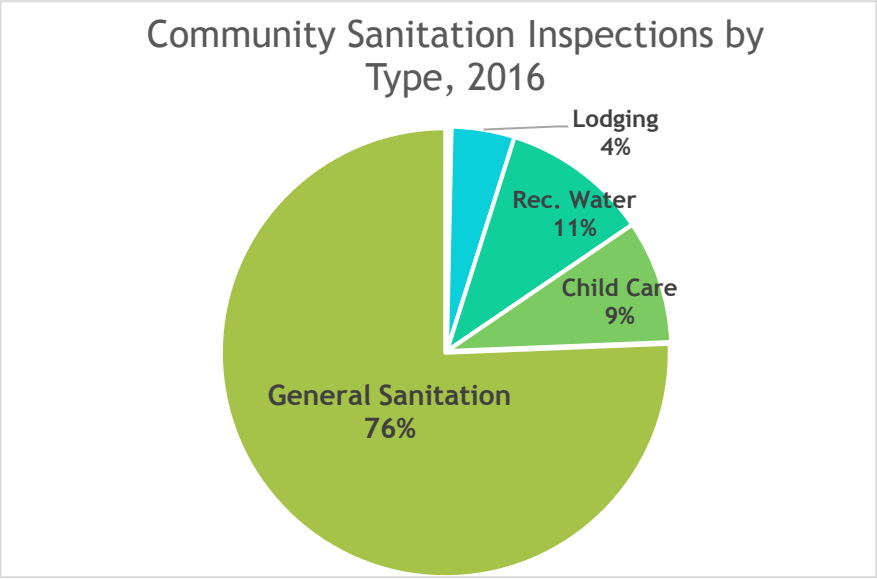
Investigations are conducted for housing/neighborhood sanitation, chemical hazards, sanitation practices, and other immediate threats to public health. These complaints are investigated for violations of local ordinances. As a rule, inspectors also check neighboring properties for exterior violations. Failure to comply with local sanitation regulations can result in administrative and/or legal action.

Accomplishments

In 2016, the Community Sanitation section conducted 3,916 inspections. This is a 23% decrease from 2015. The majority of inspections (76%) were conducted for compliance with general sanitation regulations, received from citizen complaint. The number of general

sanitation inspections increased between 2012 and 2015, due to implementation of quality improvement processes within the DOH. However, due to the implemented integrated pest management program (discussed in the vector control section), approximately 1109 complaint inspections usually conducted by Community Sanitation were investigated by Vector Control. If these complaints were first investigated by Community Sanitation, the section would have seen the 4th consecutive year of increased inspections.

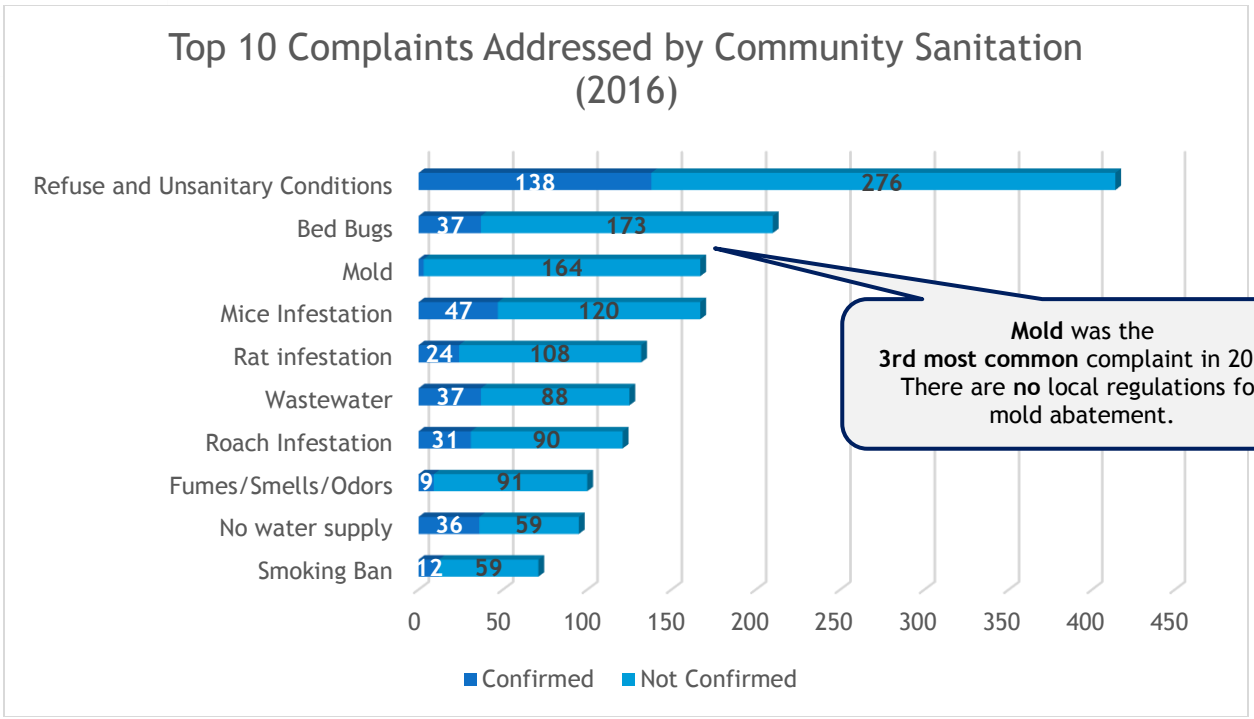
Number of Inspections by Establishment Type	2012	2013	2014	2015	2016
Massage/Tattoo Parlor	7	6	8	6	5
Fumigation	6	15	20	11	8
Lodging	65	82	98	119	178
Recreational Water	322	434	337	404	415
Child Care	359	334	349	336	348
General Sanitation	1,368	2,879	3,722	3,958	2,962
Total	**2,127**	**3,750**	**4,534**	**4,834**	**3,916**

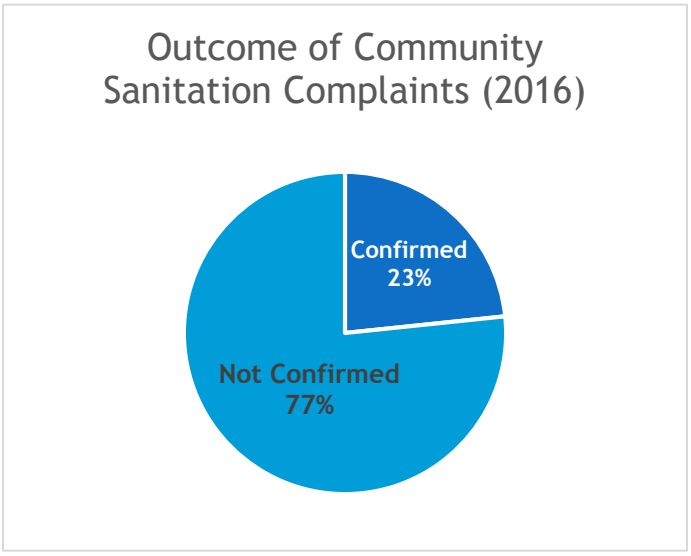


General Sanitation

In 2016, EHOs addressed 1,623 complaints from the Citizens' Service Bureau (CSB). General Sanitation complaints made up 76% of Community Sanitation inspections. Following second was recreational water inspections, third childcare, and fourth lodging.

Sanitation-related complaints are categorized into multiple different types. Refuse and Unsanitary Condition complaints are generally the number one complaint type. 33% of violations observed by EHOs was for refuse, including refuse capable of feeding or harboring rats. Second and third were pest infestations. 210 complaints were received about bed bugs. But only 15% of Community Sanitation violations included those for bed bugs or roaches and 14% for mice or rats. Smoking ban complaints made the top ten this year, at 71 total complaints, only 17% were confirmed. Overall, only 23% of all complaints were confirmed.

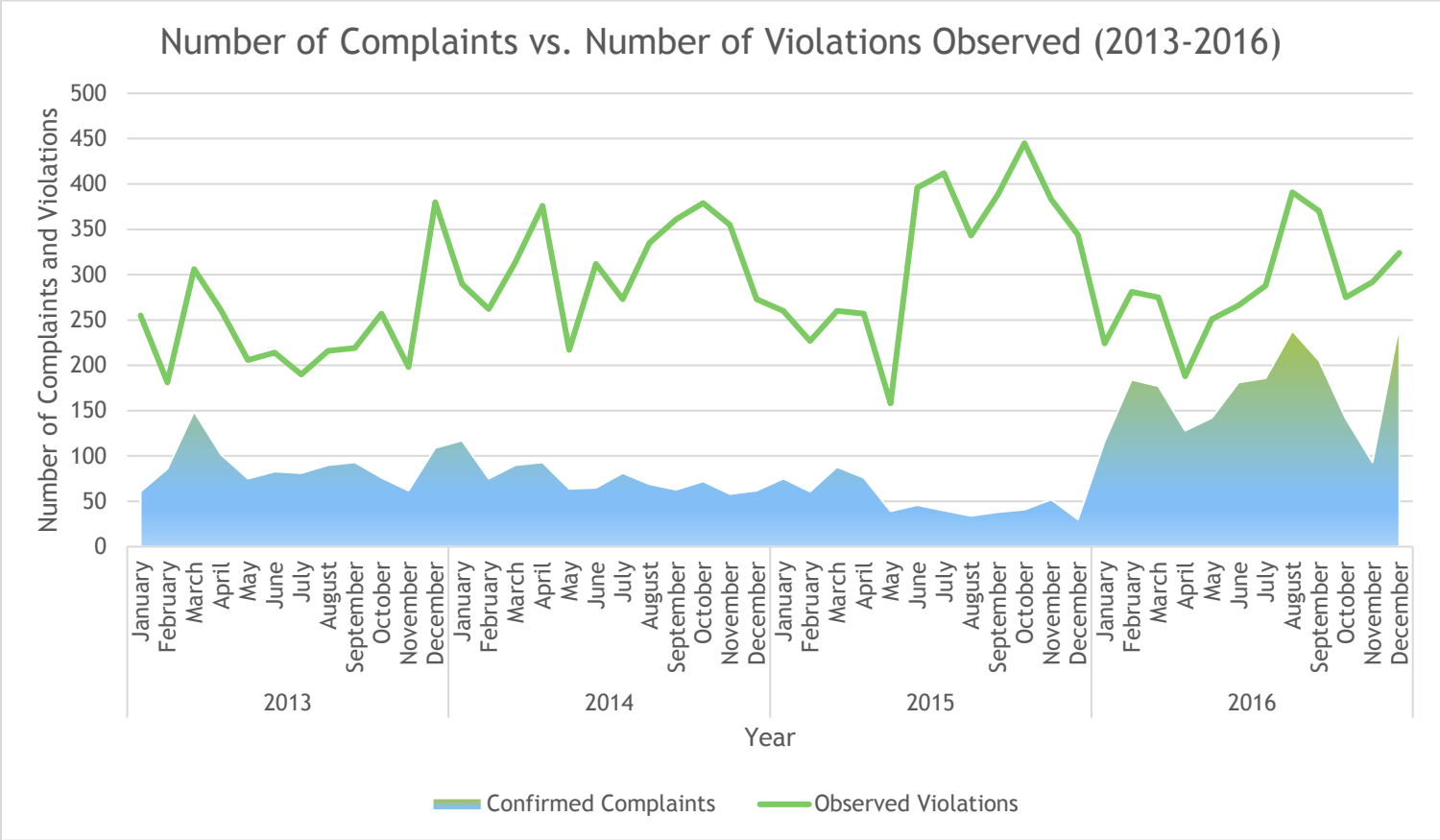




Top 5 Violation Types	
Violation	**Percentage**
Refuse Accumulation	33%
Vermin Infestation	15%
Rodent Infestation	14%
Wastewater	7%
No Water Supply	7%

While investigating complaints, inspectors are trained to do a complete and thorough inspection to address other sanitation violations within either the same dwelling or adjacent properties. The graph below shows the consistency in the trend of finding multiple violations per confirmed complaint over time. In 2015, EHOs completed public health laws training on over thirty-five local ordinance sections and codes. Coupled with the introduction of the Administration Fine Ordinance, the training allowed EHOs to establish thresholds for identification of a violation and subsequent enforcement actions. Quality improvement tools such as flowcharts, cause-and-effect diagrams, trend graphs, and check sheets were used to

identify areas to reduce complaints, but increased the number of violations observed during an investigation. This trend remained in 2016.

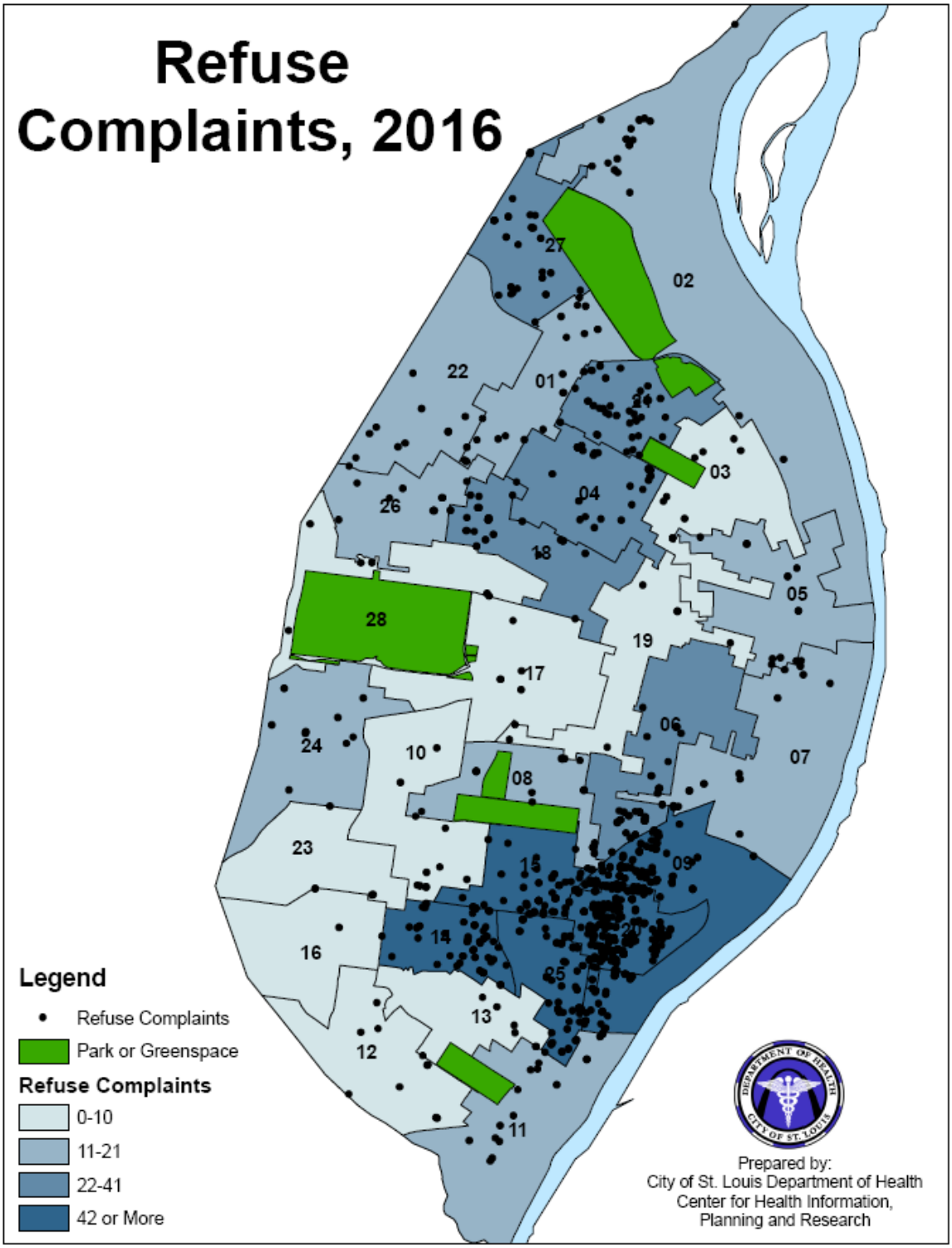


Integrated Pest Management Program

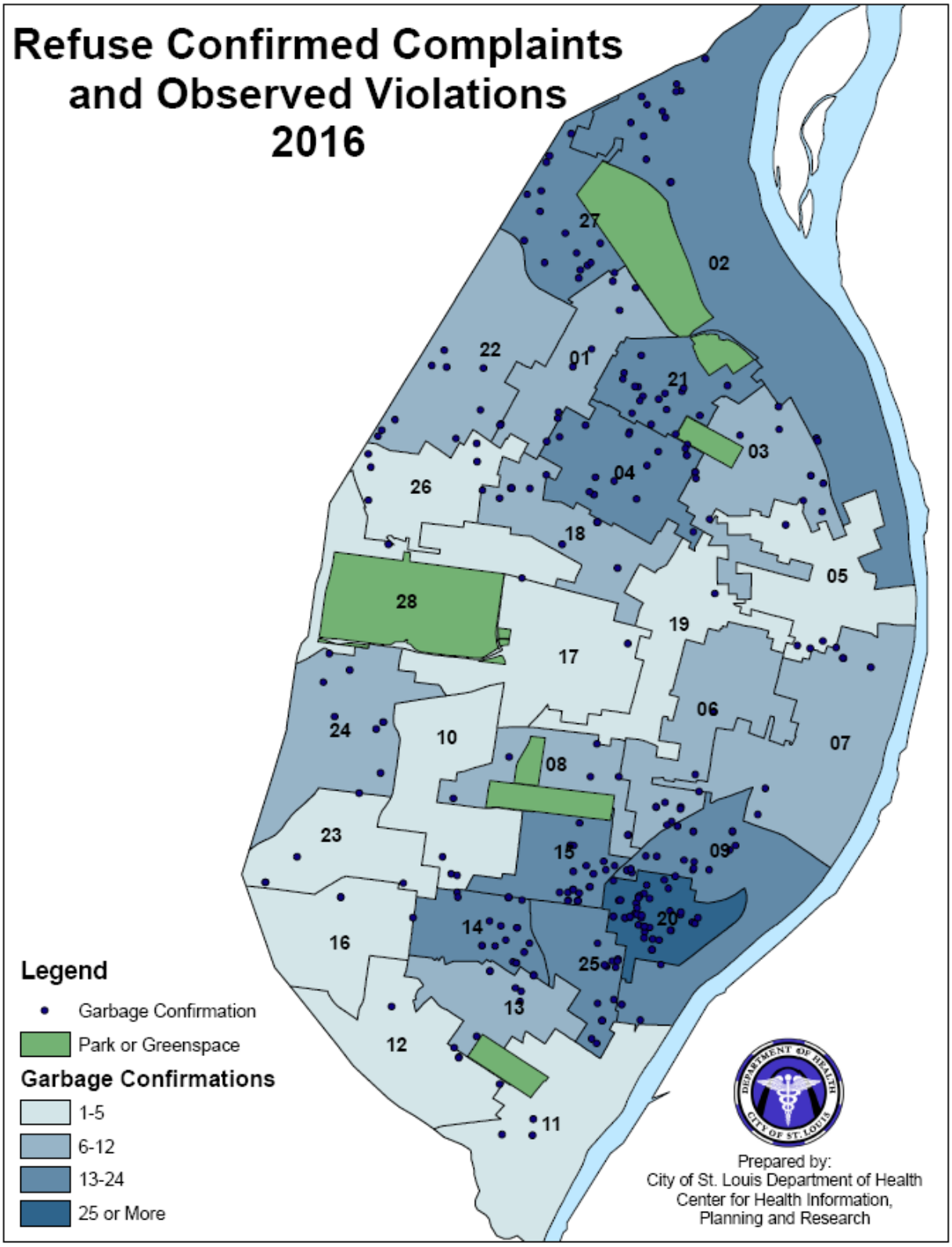
According to Healthy People 2020, exposure to the presence of trash can become a physical and social determinant of health, impacting a wide range of health, functioning, and quality of life outcomes. Accumulation of rubbish and illegal dumping can result in the spread of disease, vermin and rodent infestations, fire or chemical hazards, and nuisances. Furthermore, sustained trash accumulation in certain areas signals urban disorder and social apathy and distress which in-turn exacerbate unsanitary conditions. The atmosphere created in these areas make enforcement a challenge. Proper containment and disposal of refuse by citizens is essential for improving public health in the City of St. Louis community.

Through the Integrated Pest Management program (IPM), in 2016, Vector Control investigated 872 complaints pertaining to refuse accumulation and commercial dumpster problems. Only 34% of these complaints were referred to Community Sanitation for investigation. The majority of complaints were closed as no problem found. Vector Control, through IPM, also refers observed sanitation violations from traditional vector complaint types (rats, mosquitoes) to Community Sanitation. In turn, Community Sanitation received 341 complaints about refuse accumulation and commercial dumpster problems from Vector Control. Out of the 341 raw garbage and commercial dumpster complaints received from Vector Control, only 36% were confirmed.

The number of observed refuse violations have decreased since 2014. This is likely due to public health laws training (for EHOs), increased collaboration with partners, implementation of the Administration Citation Fine (ACF) Ordinance, increased public education opportunities and education given to the community through the IPM program. Refuse complaints were located mostly in the north central and south eastern portions of the City.

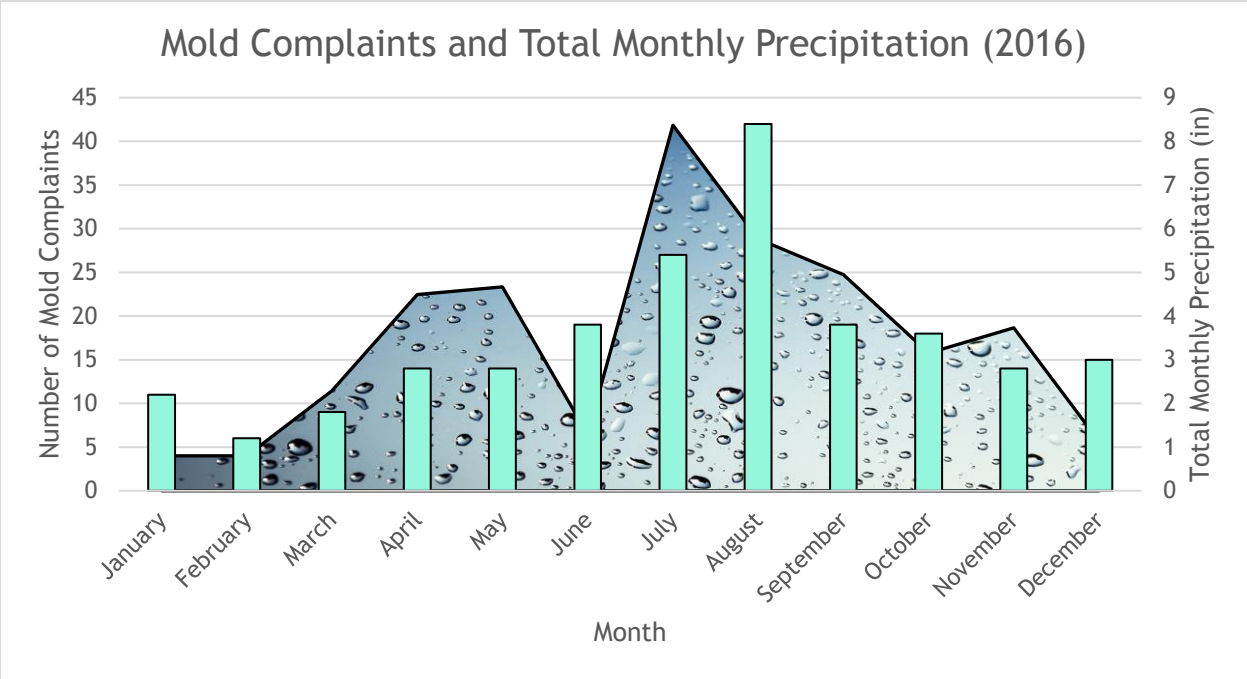


Refuse violations mimic the same trend with confirmations observed in the north central and southeast areas of the City.



Mold

The third most common complaint type in 2016 was from citizens who found what appeared to be mold in their residences. The root cause of a mold problem can sometimes be traced to a leaking pipe or plumbing fixture, which is considered a nuisance under general sanitation regulations. Increases in mold complaints are seen after peaks in monthly precipitation (August). While there are over 100,000 types of mold, only a very small amount of them pose a risk to human health. Most citizens call in about "Black Mold". Due to the pervasive nature of mold spores, the City of St. Louis does not have any local ordinances governing mold levels. Likewise, the Environmental Protection Agency (EPA) does not have any standards or Threshold Limit Values for airborne mold contaminants. The added burden of identifying mold spores is costly and intensive, so the DOH focuses on providing citizens with education on how to control indoor moisture factors to limit mold growth. The potential health effects caused by mold are broad and can vary depending on the type of mold present and your individual sensitivities. Eliminating as many moisture sources as possible will dramatically decrease mold growth.



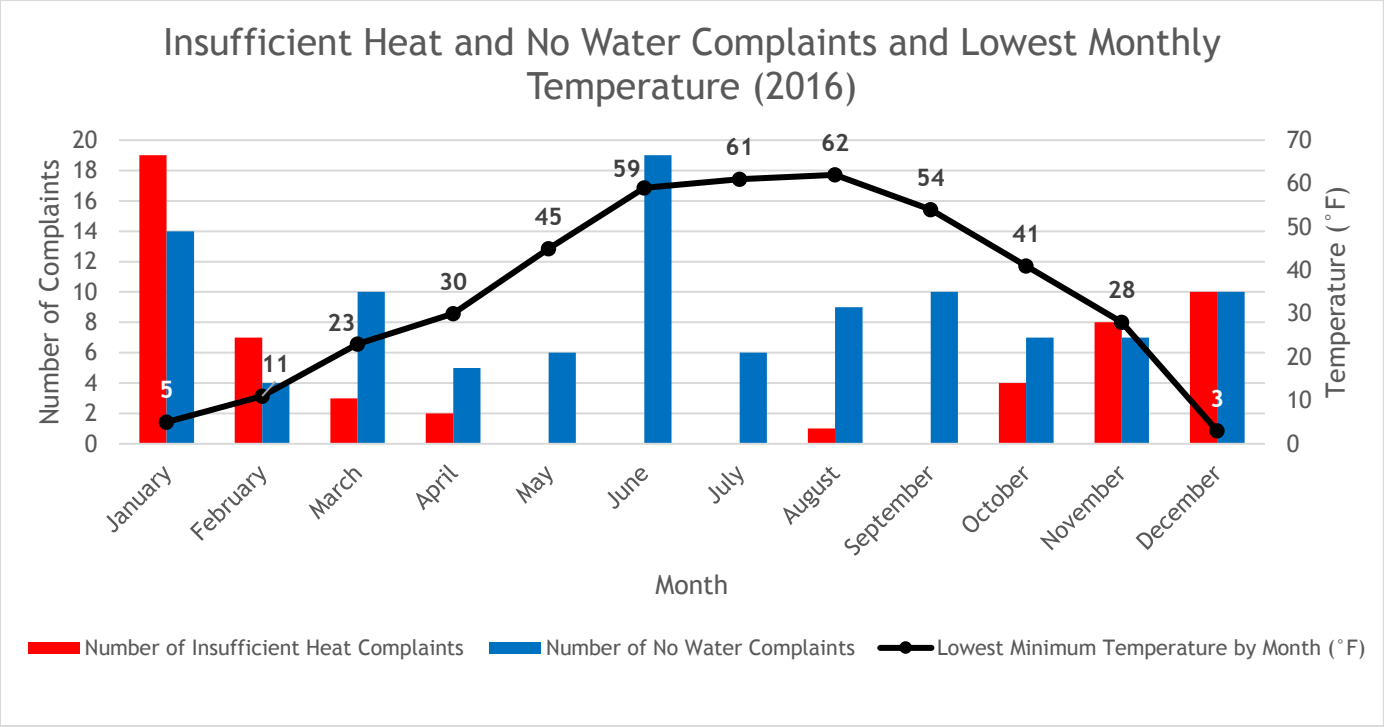
When mold complaints are received, the citizen is educated about mold and given advice on how to clean up possible mold, based on EPA guidelines. 74% of mold complaints received were closed as verbal advice given. Citizens are also questioned about the root cause of the mold problem which can sometimes be traced to a leaking pipe or plumbing fixture, which is considered a nuisance under general sanitation regulations. In 2016, EHOs went out on 206 complaints for wastewater, water leaks, defective drains/sewers, and leaking pipes and confirmed 29% of these complaints.

Priority Complaint Types: Insufficient Heat and No Water

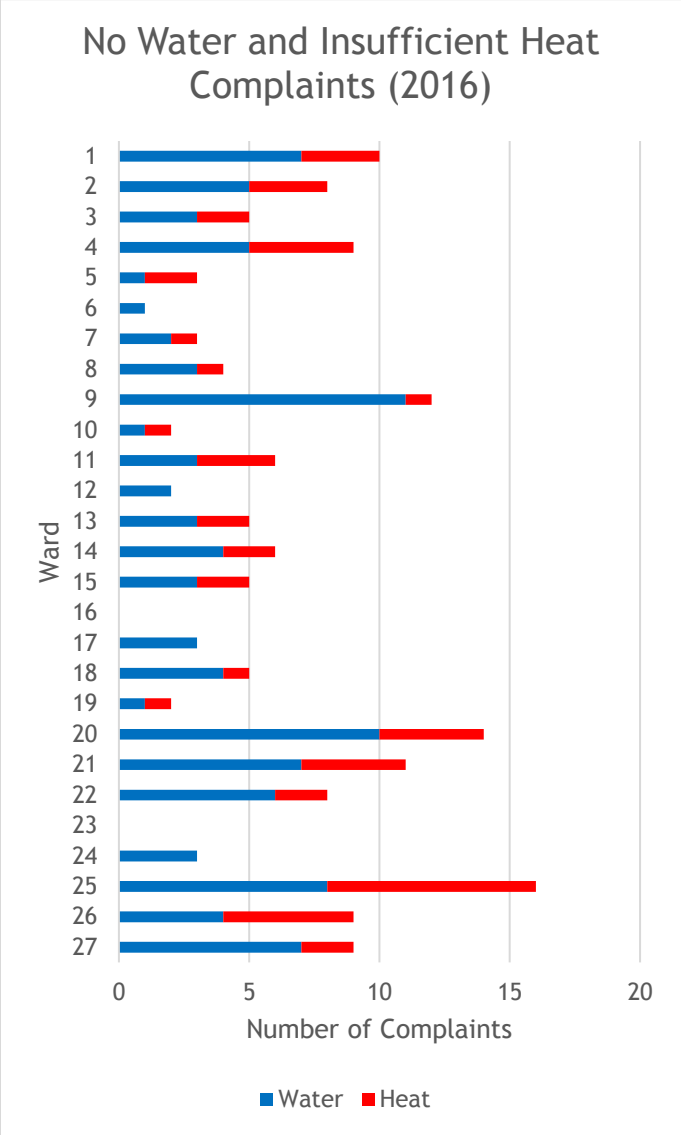
Access to running water and sufficient heat have a profound influence on human health. At a very basic level, a minimum amount of water is required for consumption on a daily basis for survival and therefore access to some form of water is essential for life. Clean and safe drinking water is crucial to sustaining human life and without it water borne illness can be a serious problem. The effects of extreme weather can cause a significant impact on health also. Acute exposure can lead to hypothermia, while exposure over time can exacerbate chronic health conditions. Thermoregulatory-impaired individuals and vulnerable populations are at increased risk of morbidity and mortality.

Community Sanitation receives complaints regarding running water throughout the year. However, only between the cold-weather months of October through April does Community Sanitation receives complaints from citizens with insufficient heat. Commonly, city residents who have insufficient heat are found to have an inadequate or inoperable furnace, overdue gas bills, or lack insulated accommodations. Citizens without water can be experiencing the effects of extreme cold weather with broken water pipes. Another hazard often observed is the inappropriate use of stoves and space heaters as a primary source of heat. EHOs respond to these complaints by assessing temperatures and access to running water throughout all habitable rooms, enforcing local ordinances, giving verbal advice, and if needed, referring the complainant to utility assistance agencies. While at the location, EHOs also give verbal advice about the proper use of alternative heating devices.

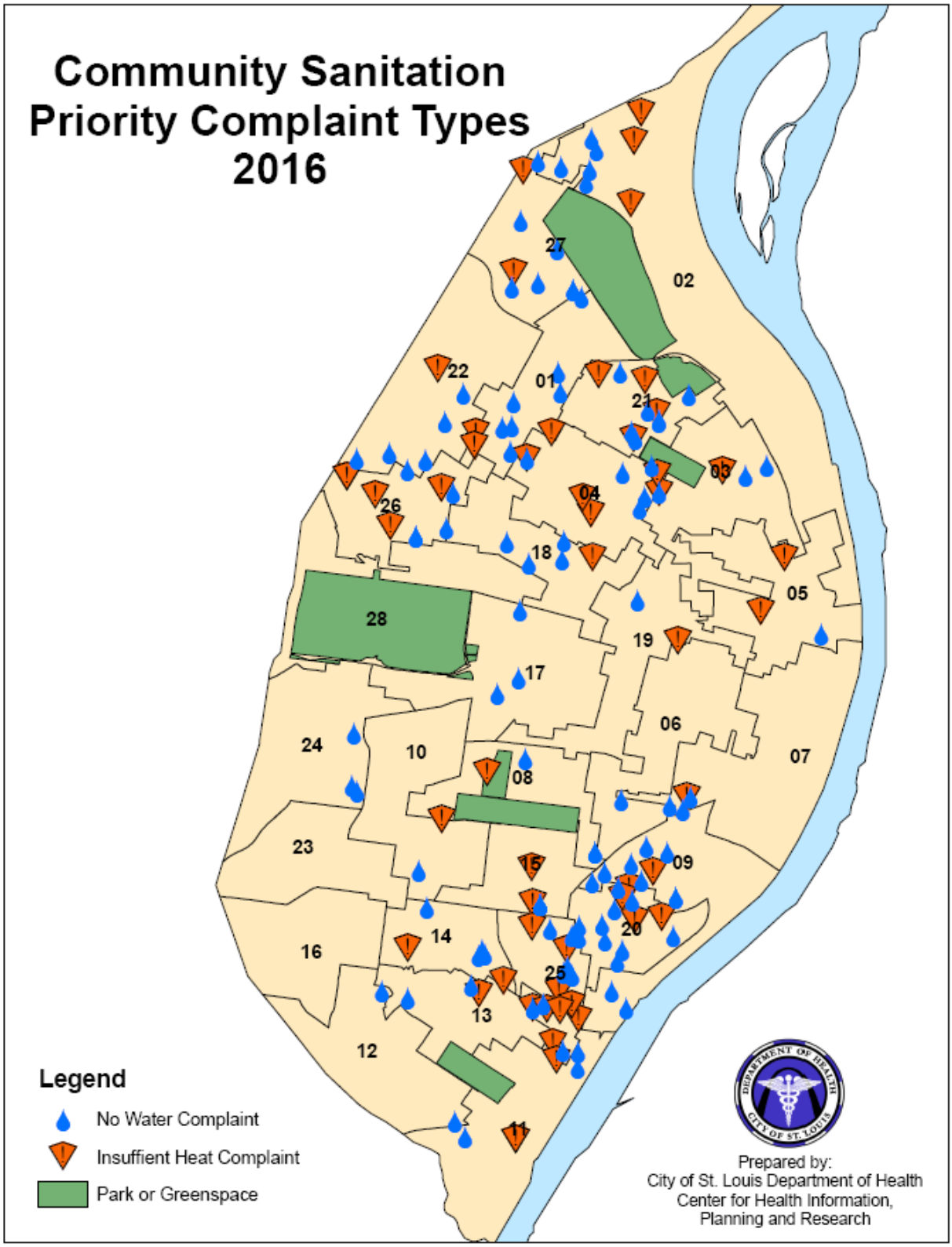
In 2016, EHOs responded to 54 complaints for insufficient heat and 107 complaints about no water supply. The months of January and February saw the coldest average temperatures; these months also saw the majority of insufficient heat complaints.



EHOs immediately investigated the circumstances of each priority complaint and confirmed 40% of insufficient heat complaints and 69% of no water complaints.



The majority of insufficient heat complaints came from the north and southeast parts of the City.

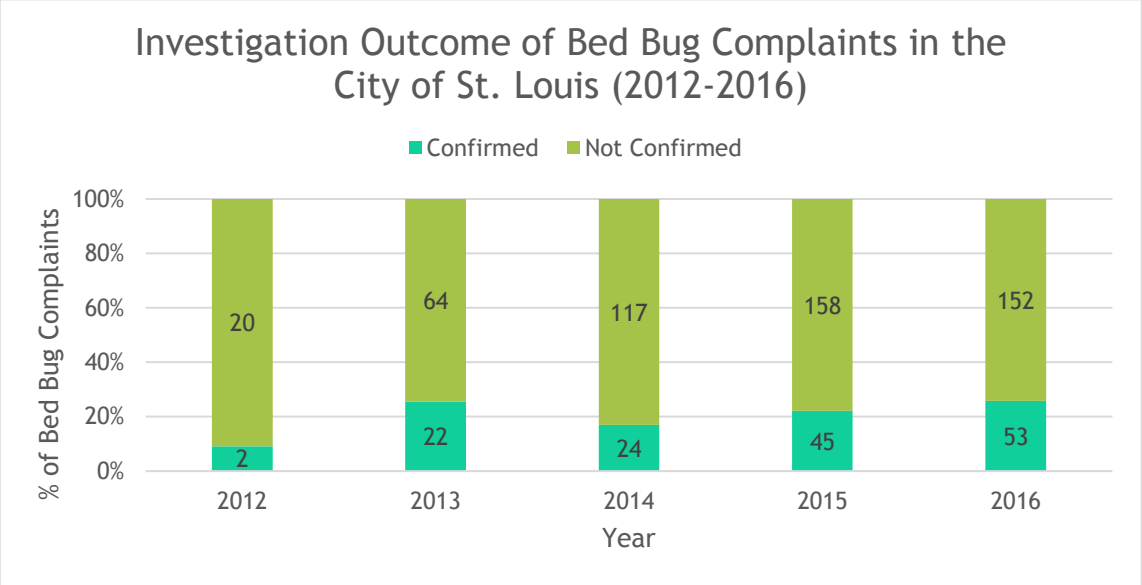


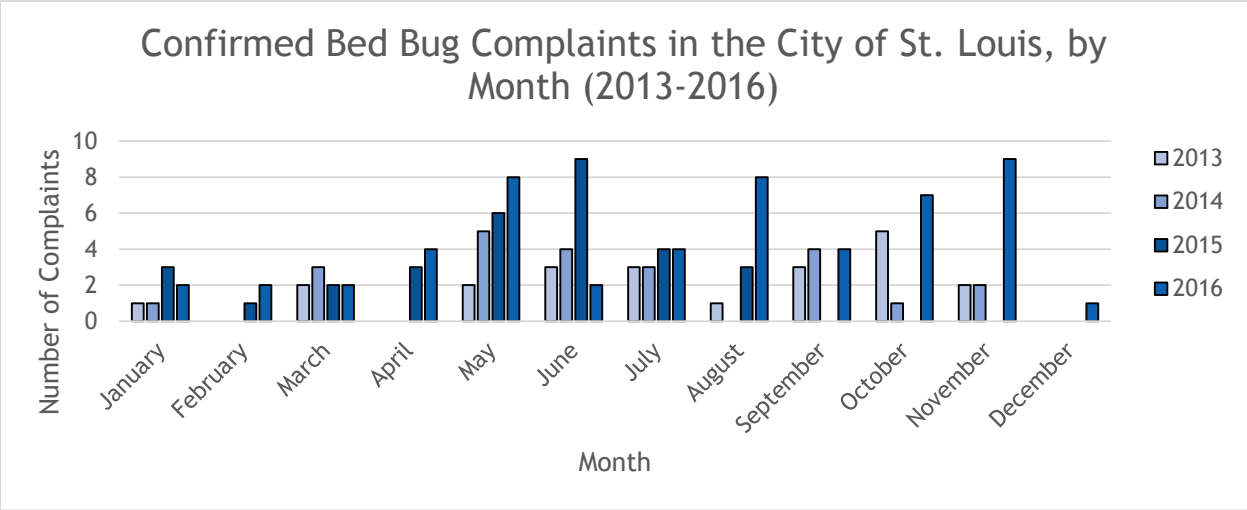
Bed Bugs

Bed bugs are wingless, reddish brown hitchhiking insects. They may migrate from one hotel or apartment to another through holes in walls, water pipes, or gutters. Given their small size and hidden habitat, bed bugs are hard to find. Adult bed bugs are approximately 5 mm in length, about the size of an apple seed. They are not known at this time to spread disease. However, bed bugs require blood meals to survive. They feed on human blood. They also feed on other warm-blooded mammals and birds. Common thought is that bed bugs come out to feed before dawn and hide during the day; however, bed bugs sense their host and will feed whenever the meal is available. Emerging pest control barriers bed bug control includes insecticide resistance. Epidemics of bedbugs have been reported in most big cities on all continents of the world.

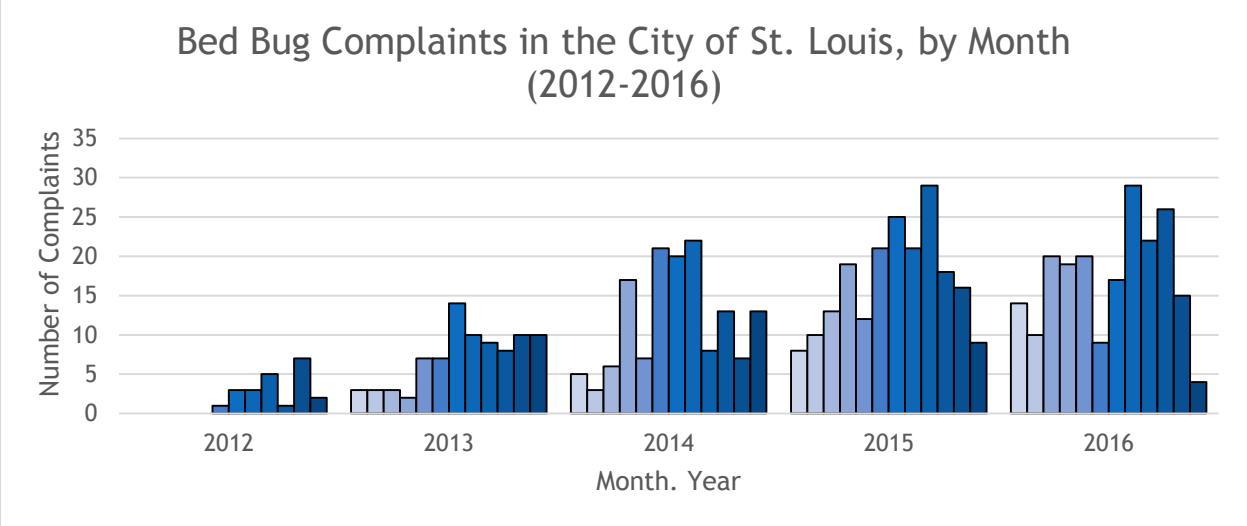
The City of St. Louis Department of Health (DOH) responds to complaints about bed bugs by performing inspections, providing prevention and control education, and enforcing code violations. EHOs are trained in identifying the pest and recognizing signs of an infestation. If a complaint is confirmed, EHOs monitor each case until a resolution or enforcement outcome is reached. Challenges to confirming bed bug infestations included lack of knowledge and complainants' confusion with exposure to biological organisms or chemical agents that cause similar irritation. Likewise, a long-term challenge that residential areas face with eliminating bed bug infestations circles back to knowledge of preventing infestations. EHOs advise residents to mark infested belongings that will get thrown out to prevent another person from picking up infested furniture.

In 2016, Community Sanitation responded to 205 complaints about bed bugs, but only confirmed 26% (53) of those complaints. Bed bug complaints peak somewhat during the summer months and the majority of bed bug complaints are seen in residential homes (91%). This is likely due to increased traveling, vacationing, common socializing, and moving from one residence to another. EHOs provide advice to the public on identification of bed bugs, prevention of infestation, and elimination of harborage conditions.

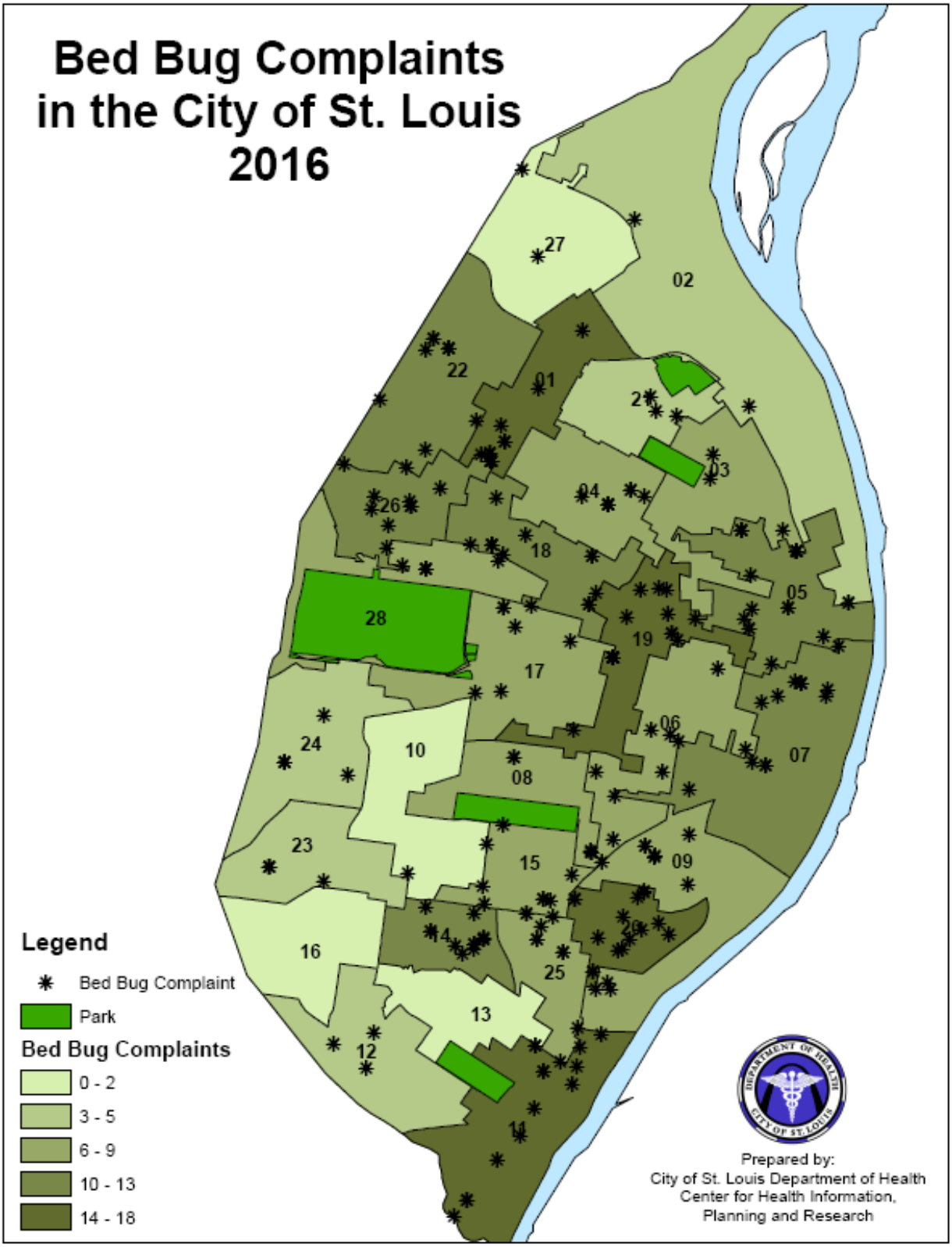




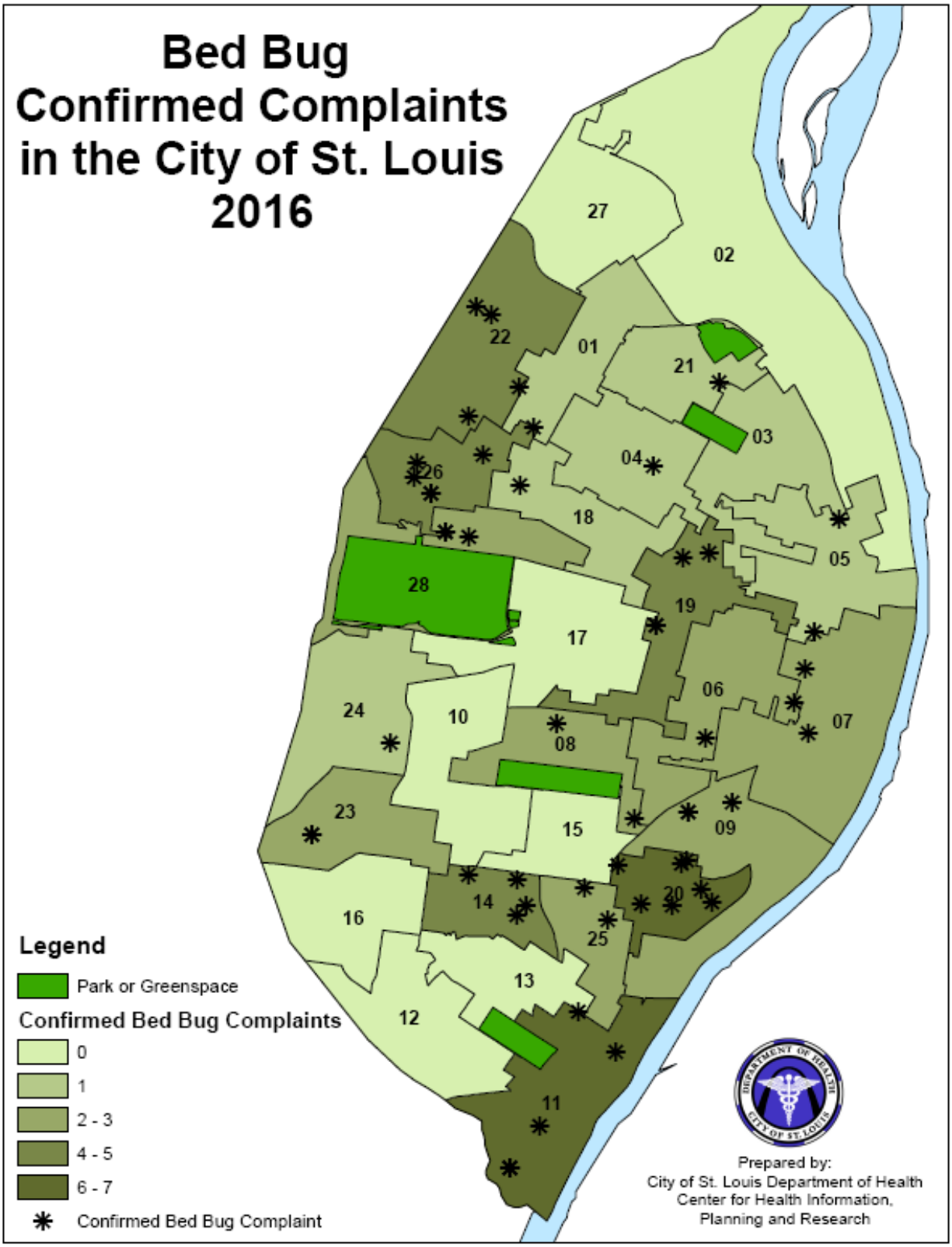
Looking at the distribution of bed bug complaints in the City of St. Louis over the last three years, an increase in complaints has been observed. Prior to mid-2012, complaint and inspection outcomes were documented on paper, but more recent electronic methods have improved tracking and analysis of bed bug surveillance.



Looking at the distribution of bed bug complaints in the City of St. Louis in 2016, the complaints were distributed across the City, with the exception to the southwest portion.

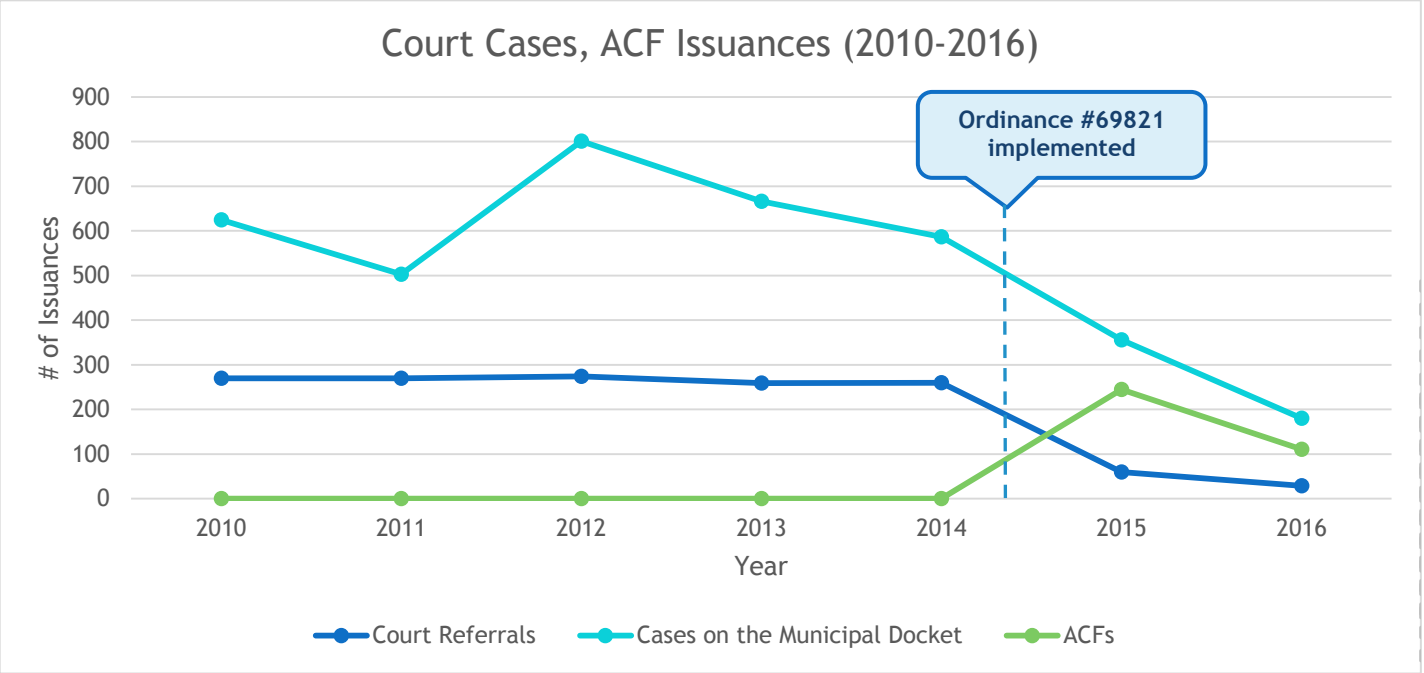


In 2016, infestations were followed the same trend as complaints, distributed across the City, with the exception to the southwest portion.



Administrative Fine Ordinance #69821

Board Bill 94 was introduced and approved in 2014 for an Administrative Citation Fine (ACF) Ordinance #69821. This ordinance pertains to enforcement of code violations relating to health and safety, effective January 24, 2015, and allows the time and resources spent by the DOH to hold people accountable. Also as an intended result, the health of the community will improve because of the escalation of consequences. Generally, an EHO utilizes the ACF process for most non-critical violations. For the priority violation types (no water supply, insufficient heat, hazardous waste), the municipal court system would be used. In instances where the at-risk population are affected (children, elderly), the municipal court system may be used for non-critical violations. The Community Sanitation section prepared and began establishment of a systematic workflow for enforcing this ordinance in the latter part of 2014.



This ordinance gives the legal authority to levy an administrative citation fine, depending on the code violation. The benefits of ACFs include:

- Increased and timelier compliance with escalating consequences
- Greater likelihood for health violations' abatement
- Heightened awareness regarding code enforcement

Since implemented, EHOs referred 69% fewer cases (407) to court in 2016, compared to 2014. Instead, 111 ACFs were issued through the new process.

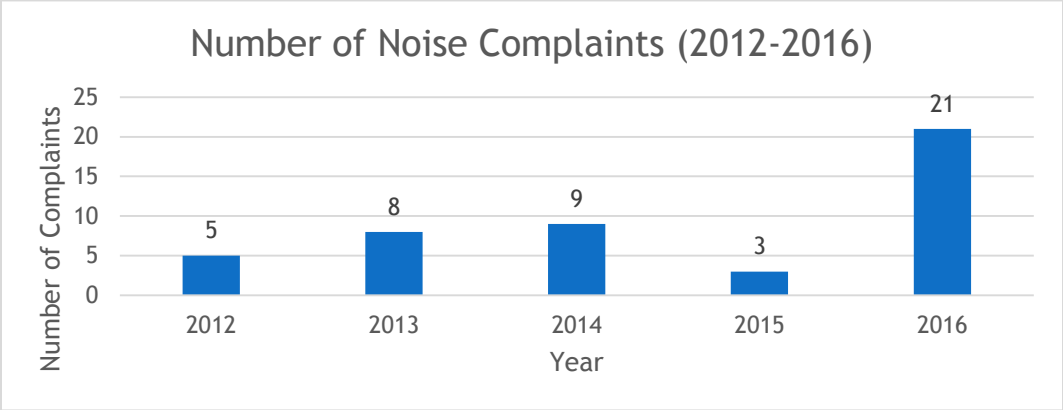
Number of Court Referrals and Court Cases							
	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Court Referrals	-	-	274	259	260	60	29
Cases on the Municipal Docket	625	503	801	666	587	356	180
ACFs	-	-	-	-	-	245	111

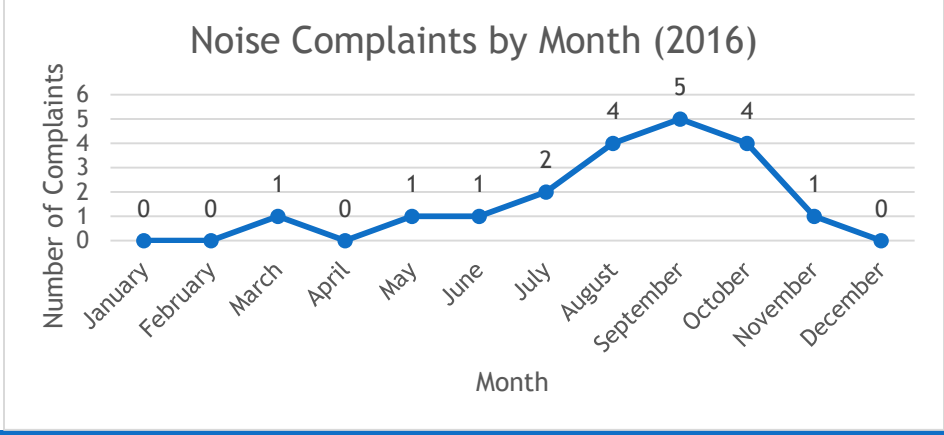
Noise

The major sources of chronic unwanted noise in the United States include road, rail, and air transportation. Adverse health effects are possible with enjoyable sources—loud sporting events, firearms, and music. Exposure to noise constitutes a health risk. There is sufficient scientific evidence that noise exposure can induce hearing impairment, hypertension and ischemic heart disease, annoyance, sleep disturbance, and decreased school performance. Noise activates the body's sympathetic nervous system, raising blood pressure and heart rate. Although inhabitants of noisy environments may be able to tune out noise, that habituation does not appear to extend to the cardiovascular system during nighttime exposures. Repeated arousals have been reported to prevent blood pressure from dropping during sleep the way it's supposed to. Disrupted sleep is also associated with increased levels of lipids and the stress hormone cortisol, potentially increasing the risk of disorders such as depression and atherosclerosis.

The EPA's limit for protecting against all health effects of noise is a 24-hour average 55 dBA, weighted with a penalty for nighttime exposures to account for the special impact of disrupted sleep. According to the Ordinance #68130, permissible noise levels are set depending on zoning. Noise levels in zone A (single-family residential) are more stringent than those in zone J (industrial district).

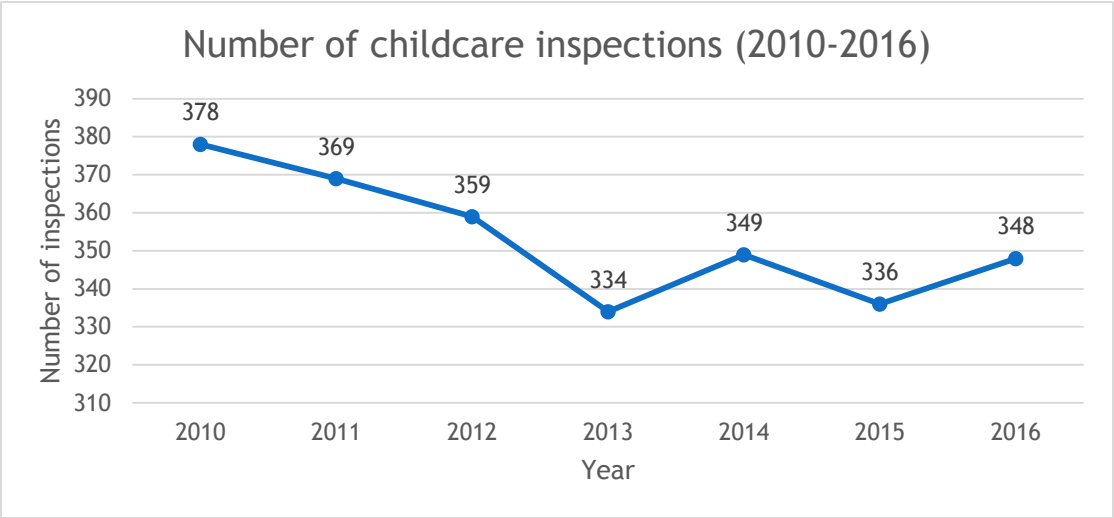
In 2016, Community Sanitation received 21 noise complaints, more than the last 3 years combined. This increase can be attributed to stories in the news media about noise, generators in particular, and the number of current construction projects, building and road related. Noise complaints peaked in September but the majority were received from July and October.





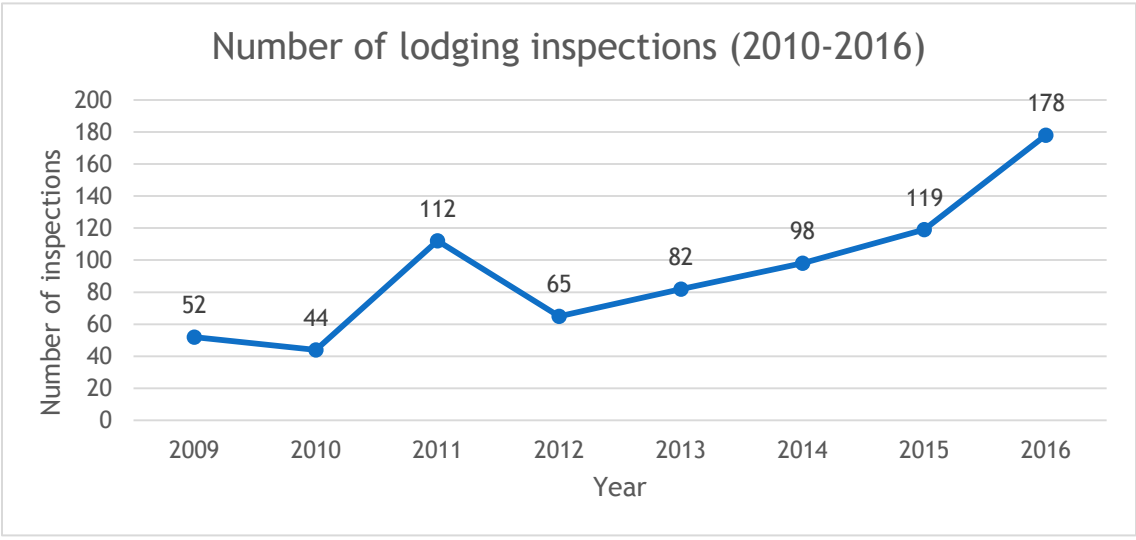
Environmental Child Care

Group child care homes, child care centers, family child care homes, and license-exempt child care facilities are inspected annually under state regulations. In 2016, there were 348 child care facilities that were inspected by EHOs at the request of the Missouri Department of Health and Senior Services Section for Child Care Regulation Division of Regulation and Licensure. This was a 3.5% increase in inspections, compared to 2015.



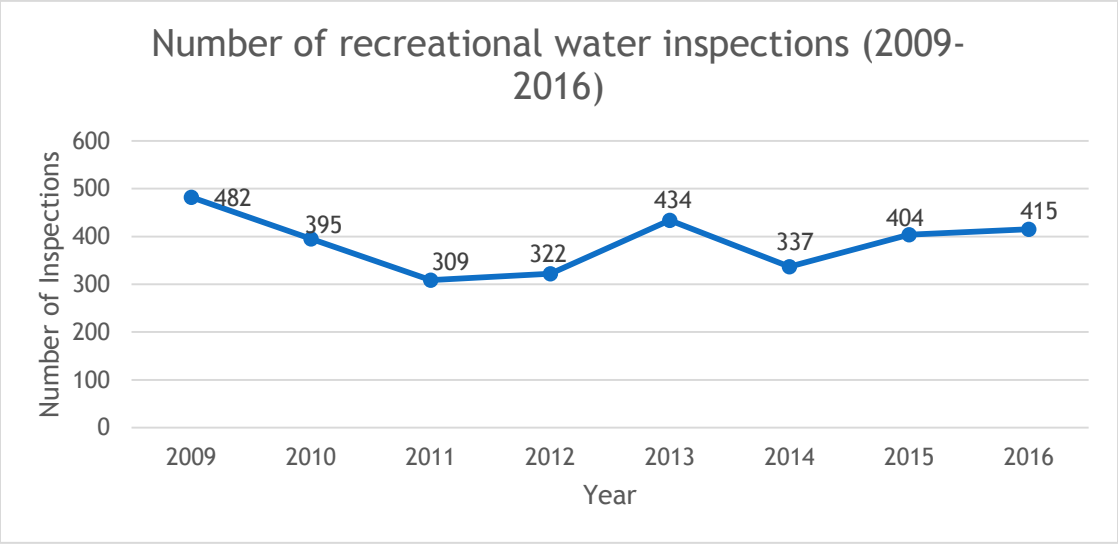
Lodging

Lodging establishments, or hotels and motels, are inspected annually under state regulations. Any operating facility that is a building or group of buildings where five or more guest rooms are provided, which is held out to the public for hire and advertising as such, is considered a lodging establishment and must have a license. In 2016, 48 hotels were inspected for the 2015-2016 licensing year. EHOs conducted 178 inspections and re-inspections at these facilities, a 49.5% increase in inspections than 2015. This increase can be directly attributed to increased training, understanding of lodging regulations and collaboration with State officials.



Recreational Water

Non-residential swimming pools, spas, wading pools, and splash pads are inspected monthly under local recreational water facility ordinances. Swimming pools are treasure troves for bacteria, mainly due to vomit and fecal contamination. In order to protect the health of the public from these threats, EHOs conduct their inspection using a safety checklist and a water chemistry kit. Free chlorine, pH, water clarity, and total coliform counts are assessed in every pool. There were 105 pools and spas under regulation in the City of St. Louis in 2016. Outdoor pools are closed seasonally (winter), but re-open after the Memorial Day Holiday. In 2016, 415 pool inspections took place, very similar to inspection counts from 2015. The increase is partially due to an additional 38 inspections done for Virginia Graeme Baker compliance through a contract with the Consumer Product Safety Commission. This contract was completed on-time, with all paperwork submitted by the deadline.



AIR POLLUTION CONTROL

Overview

Air pollution is associated with a variety of negative health conditions. According to the World Health Organization, high levels of air pollution are associated with cancers of the lung, urinary tract, and bladder. Other conditions associated with high levels of air pollution are stroke, heart disease, asthma, chronic obstructive pulmonary disease, and acute lower respiratory infection. Research has connected air pollution to negative pregnancy outcomes as well, particularly premature birth and low birth weight.

In the past 25 years, air pollution has steadily decreased in the City of St. Louis. Air quality in the St. Louis area has improved due in large part to the implementation of the following control programs: Passage of the Clean Air Act, more restrictive emission standards for cars, stricter standards for diesel engines, and increased production of low-sulfur diesel fuels.

In 2011, funding for the local air pollution program ended, and the Missouri Department of Natural Resources absorbed the responsibility of enforcing the United States Clean Air Act. This consisted of permitting and monitoring sources of air pollution in the state. Following these drastic cuts, the City of St. Louis Department of Health Air Pollution Control (APC) section narrowed its focus to reviewing asbestos abatement and authorizing demolition permits.

What We Do

The Air Pollution Control (APC) section permits, inspects, and enforces local regulations for asbestos abatement and demolition projects.

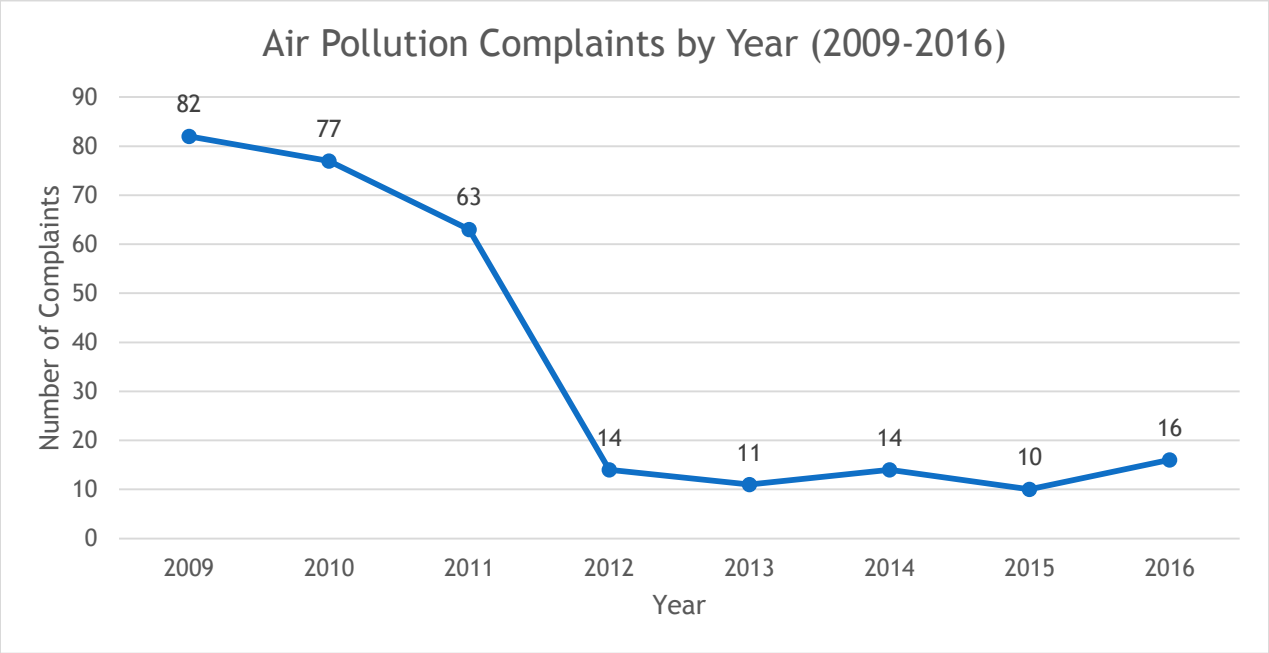
Many structures in the City of St. Louis contain asbestos, a naturally occurring mineral fiber used in construction between the 1930s and 1970s. Having asbestos in your home does not pose a hazard unless there is damage or a demolition is planned.

However, damage or unsafe demolition can cause asbestos particles to become airborne. Research shows that fibers stay in the air for long periods and can cause significant health problems. The three major health risks associated with asbestos exposure are: asbestosis, mesothelioma, and lung cancer. Research studies have also linked inhalation of asbestos fibers to several other types of cancer including: laryngeal, pharyngeal, stomach, and colorectal cancers. There is currently no known safe level of asbestos exposure, and those most at risk are construction workers and demolition contractors that work in the construction industry.

Demolition permits and asbestos notifications improve health because they allow APC to monitor situations where asbestos is a threat to public health. APC can then ensure demolitions and repairs are performed safely in a way that will not harm citizens.

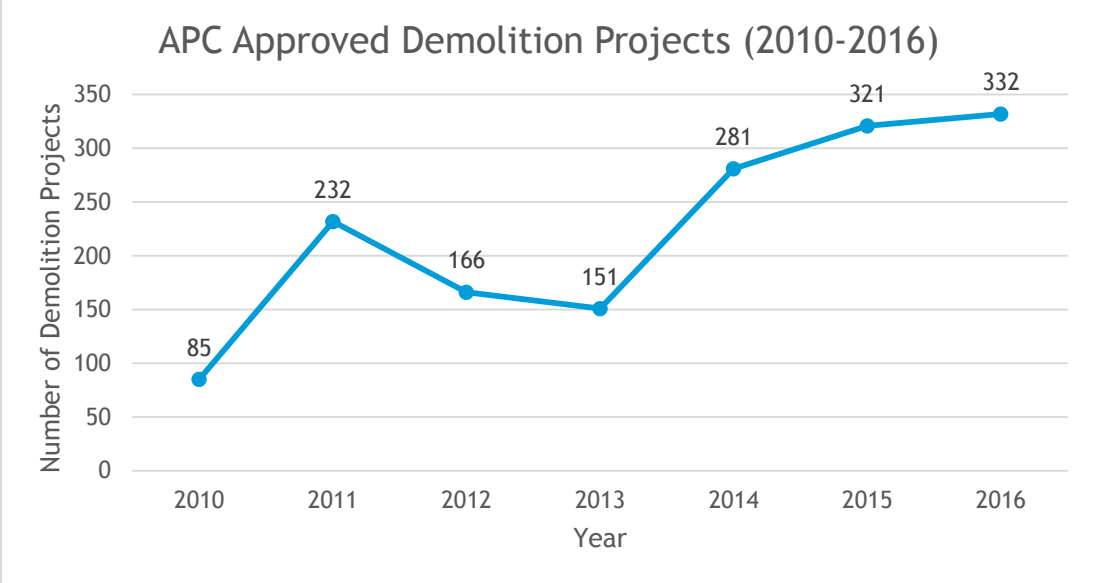
Accomplishments

In 2016, Air Pollution Control investigated 16 complaints from CSB. This was an increase from 2015; however, the quantity of complaints received per year has remained relatively steady since the migration of responsibilities to the state. Most often, air pollution complaints received were to investigate possible asbestos exposure.

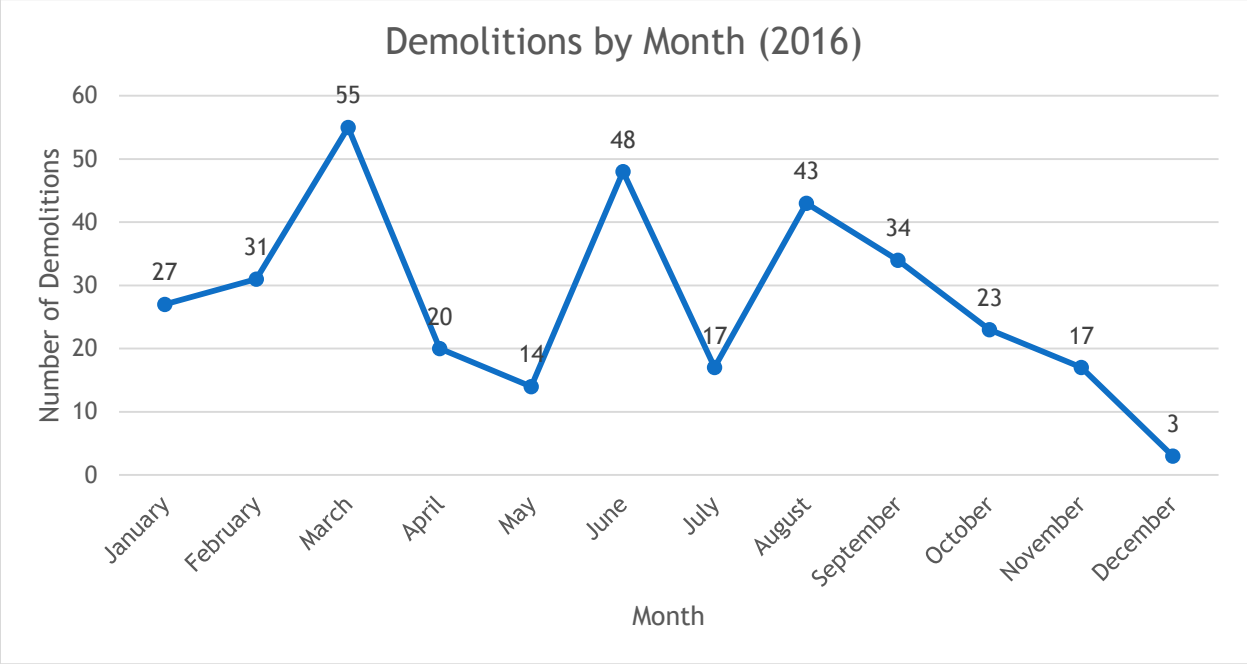


Demolitions

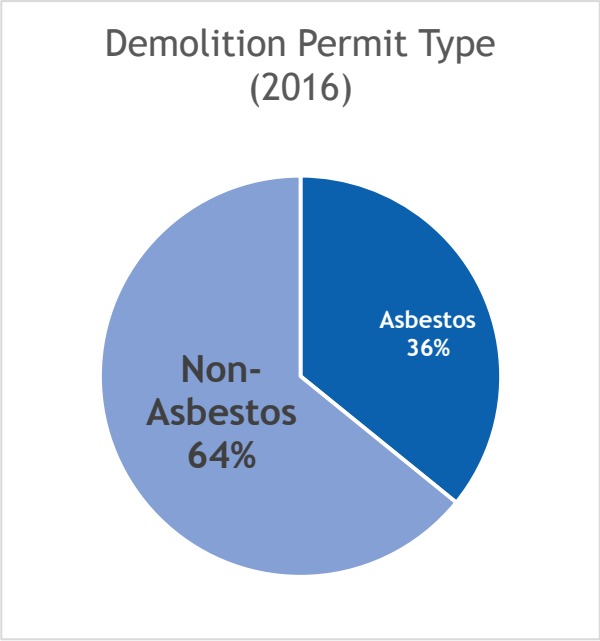
In 2016, 332 demolition permits were approved for construction projects. This was a 3% increase from 2015.

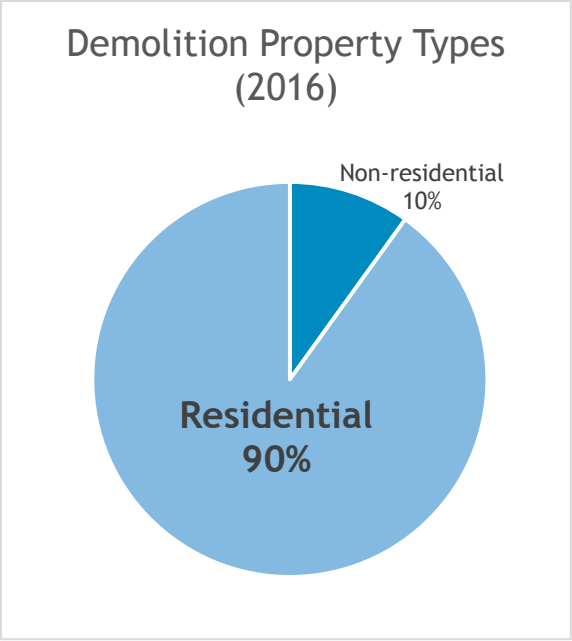


APC demolitions also occur more through the warmer months, as predicted. Most demolitions were approved between March and August.

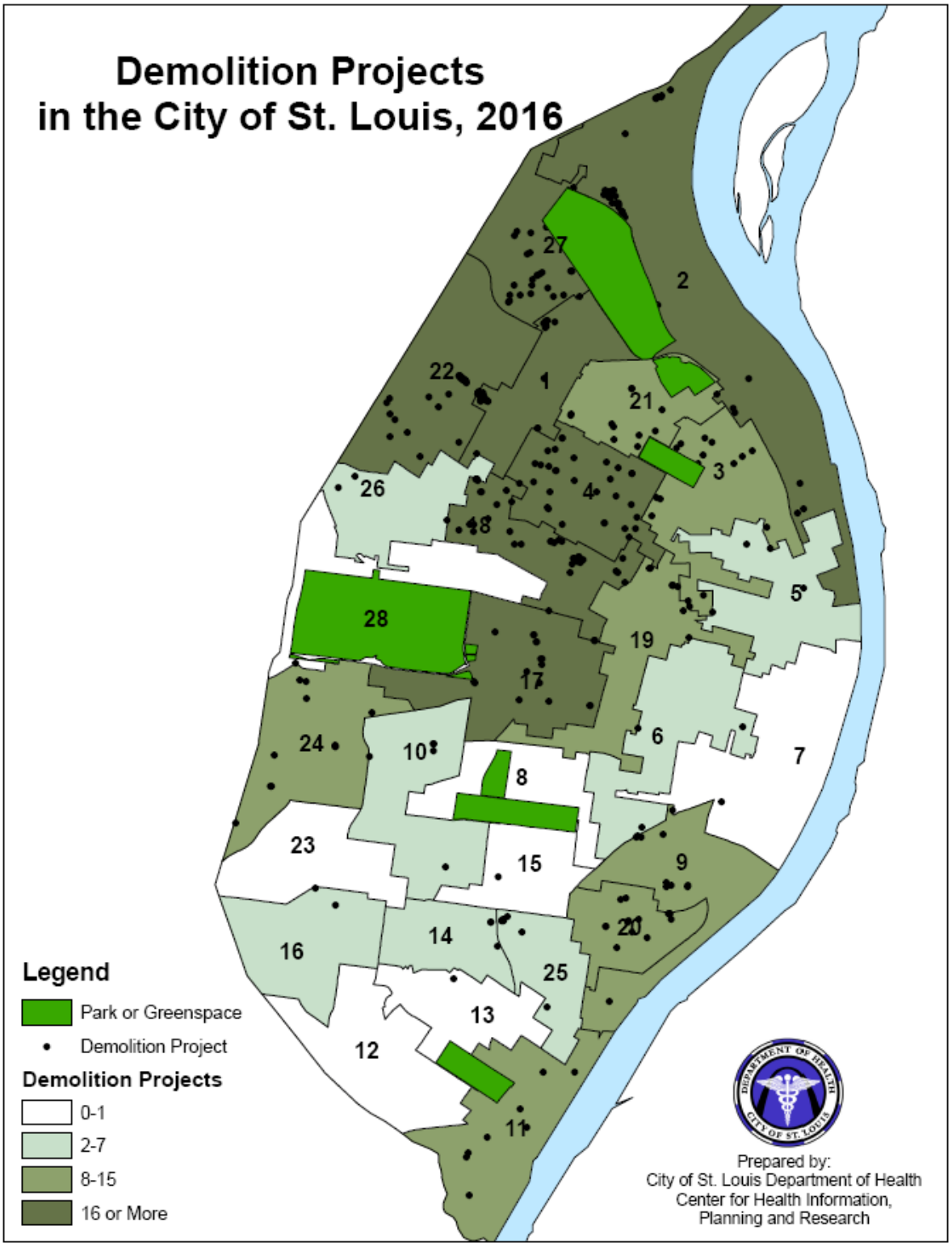


Only 36% of the demolition permit approvals involved asbestos and the majority of permits (90%) were approved for residential structures.



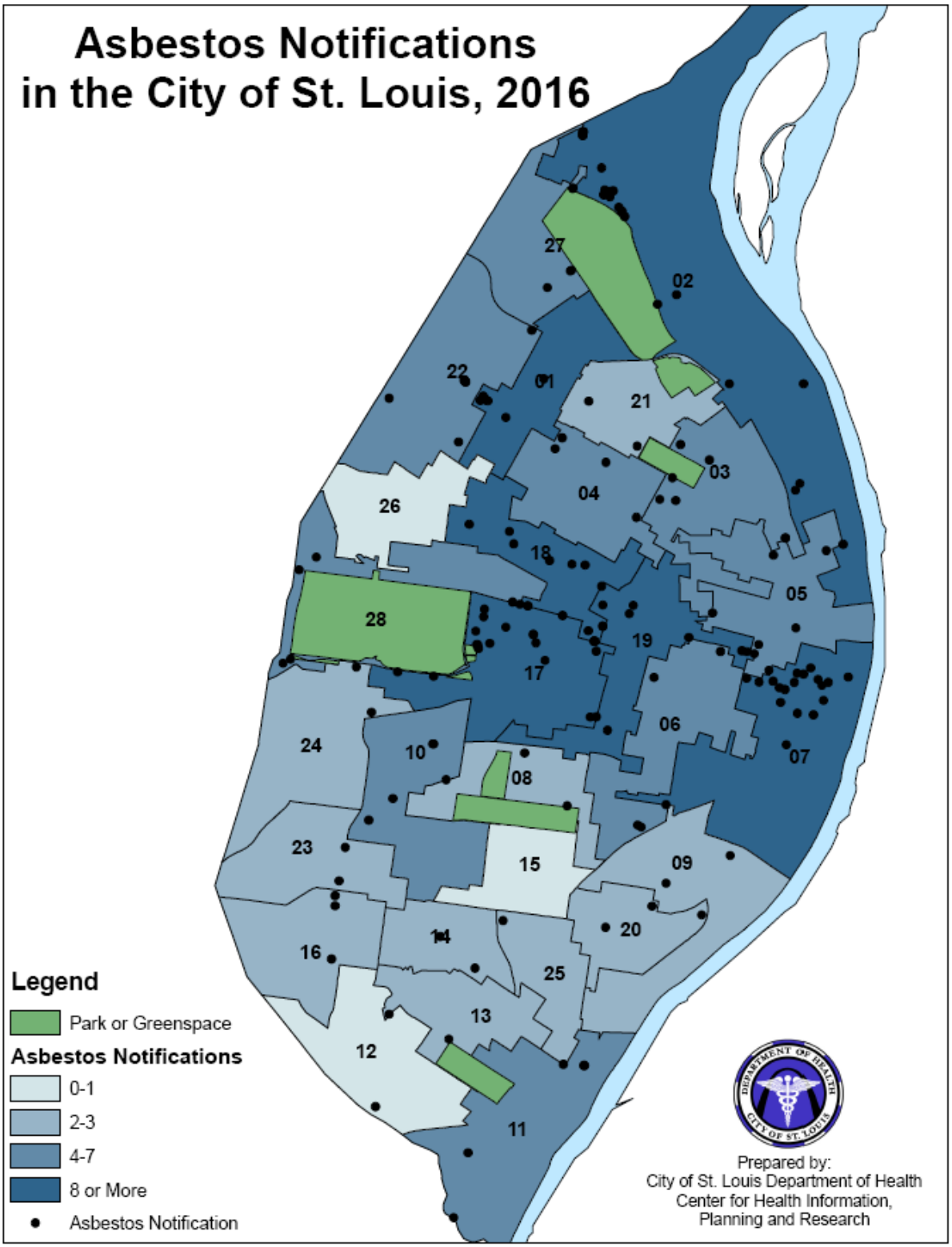


Demolition projects were located predominantly in the northern region of the City.



Asbestos

In 2016, approximately 171 asbestos notifications were approved by APC. These projects were located predominantly in the northern regions of the City.



Animal Care & Control

Overview

Human health is distinctly linked to animal health and the surrounding environment. Due to the large number of communicable diseases (zoonoses) that can be transmitted from animals to humans, the World Health Organization recognizes veterinary medicine as a contributor to the maintenance and promotion of public health. Local public health agencies often lead their community's animal control and health initiatives by providing shelter and veterinary services for animals in need.

What We Do

The mission of Animal Care and Control (ACC) is to ensure the health and safety of City of St. Louis residents and companion animals through the enforcement of pet-related ordinances, as well as the promotion of pet safety and responsible pet ownership. Animal Care and Control is dedicated to providing an array of animal control, health and pet-owner services to promote responsible pet ownership and humane treatment of animals among the citizens of St. Louis.

Animal Care & Control Officers (ACCOs) investigate animal abuse and neglect, investigate and rescue abandoned animals, investigate animals attacking people and other animals, rescue injured animals and animals in distress, investigate ordinance violations (such as: leash law, feces removal, pet limit, prohibited pets, tethering, and welfare/care violations), educate the public on ordinances and responsible pet ownership, and assist the Police Department, Fire Department, Sheriff's Department, and EMS with emergency situations.

Accomplishments

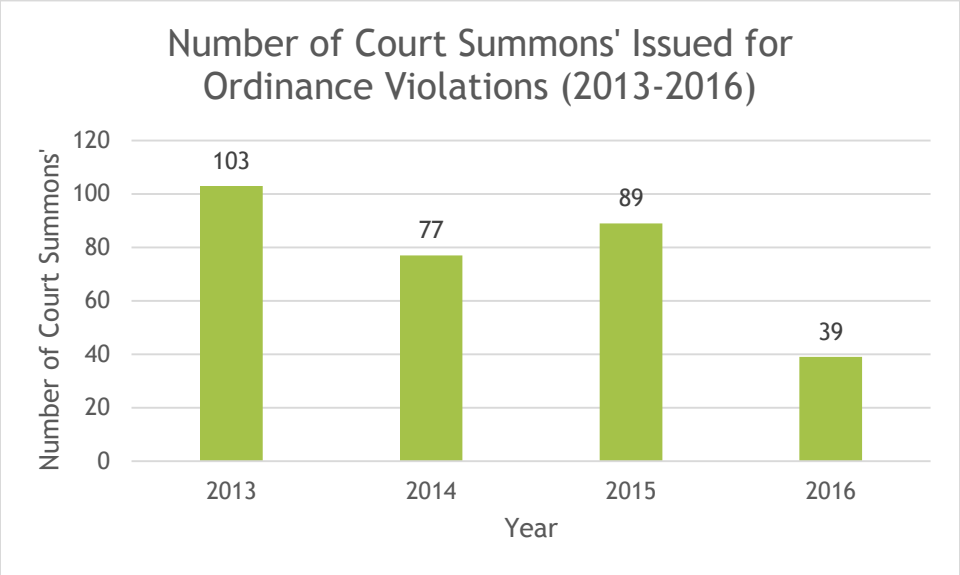
In 2016, ACC received and addressed 4014 complaints, the most complaints received in at least 6 years. The most common complaint (31%) was for stray animals.

Other programmatic accomplishments in the past five years include:

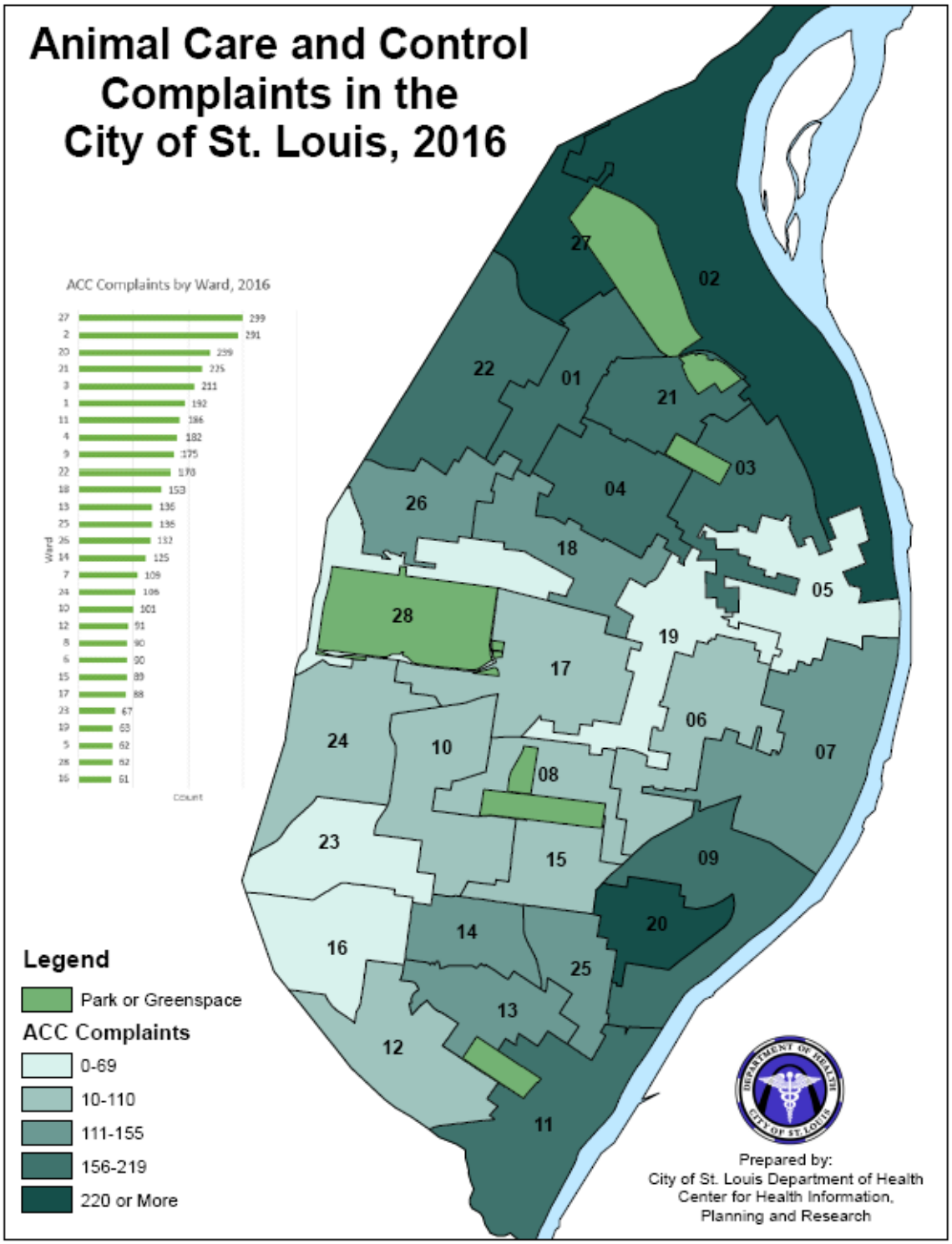
- Increased our partnerships with animal welfare, service, and control agencies
- Increased grant funding to our partners
- Implemented an Administrative Citation Fine process
- Issued a request for proposals to privatize the operation of the animal shelter

Enforcement of Local Ordinances

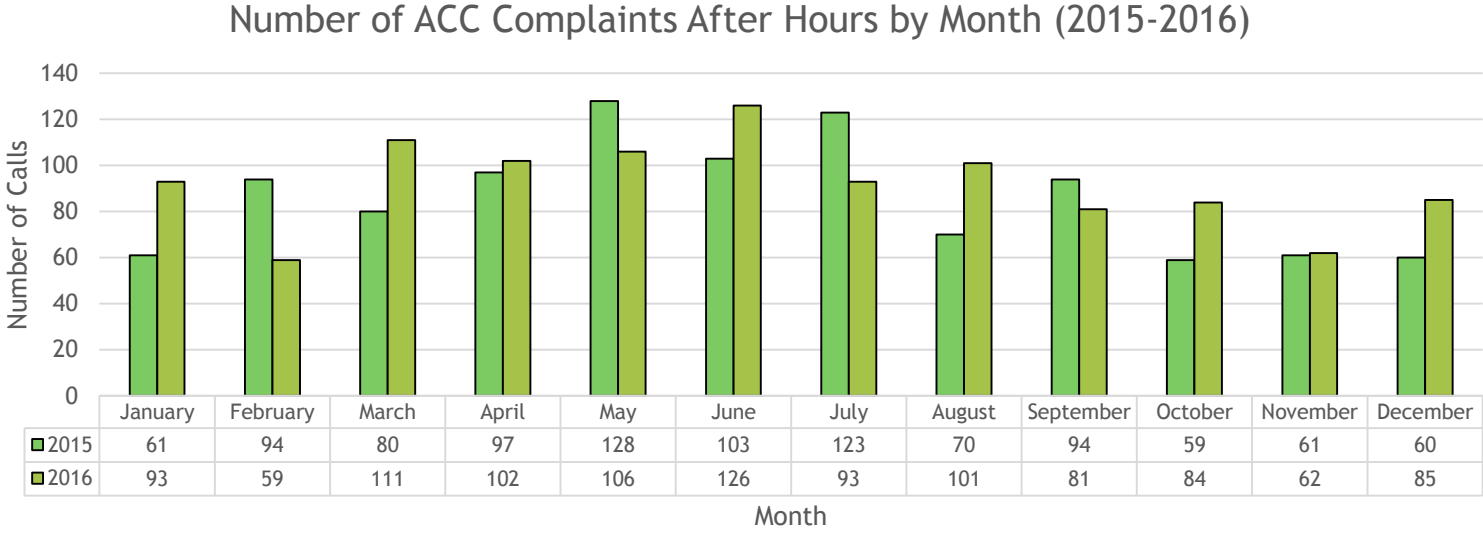
In 2016, CSB submitted 760 complaints to ACC for enforcement of local ordinances. These ordinances protect and promote the general welfare of the citizens and animals living in the city with strong emphasis placed on responsible animal ownership. Upon investigation, ACCOs issued 39 court summons in 2016. Use of Administrative Citation Fines and limited staffing possibly contributed to the reduction in court referrals.



The main animal ordinances cover registration laws, vaccination laws, leash requirements, feces removal, tethering laws, pet limits, and prohibited pets. The majority of these complaints came from citizens in Wards 27, 2 and 20. The majority of confirmed complaints were observed were in the north, and southeast parts of the City.



ACC is the only section that operates 24 hours a day, 7 days a week. ACCOs respond to emergency calls from police dispatch whenever necessary. In 2015, the section made improvements in data management to capture ACC's workload after hours; these indicators were not previously tracked or quantified. After hours complaints are received throughout the year.

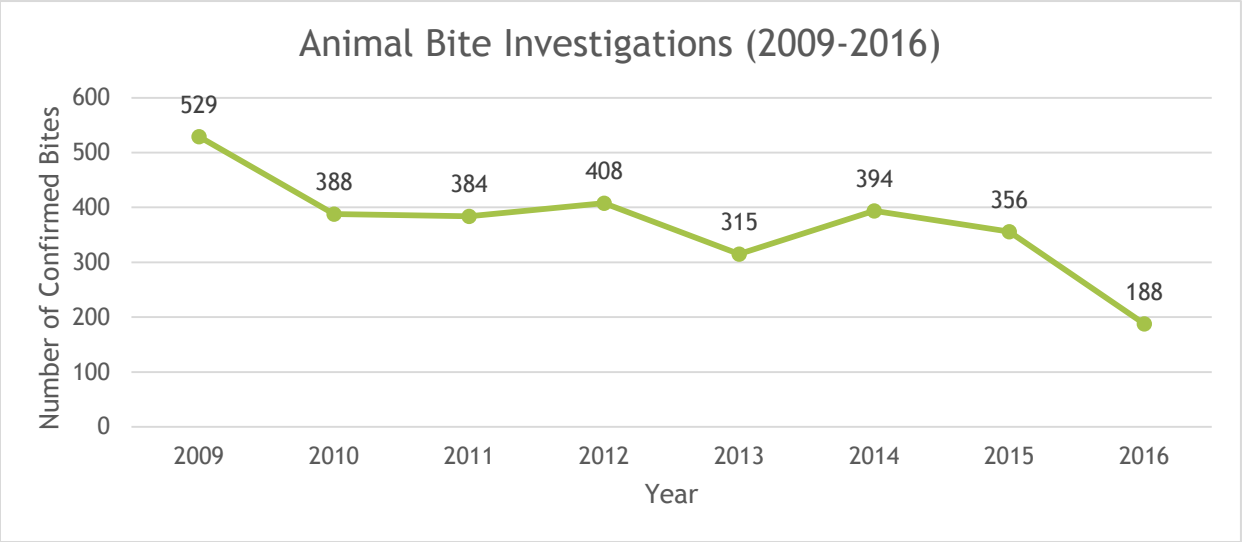


	January	February	March	April	May	June	July	August	September	October	November	December
2015	61	94	80	97	128	103	123	70	94	59	61	60
2016	93	59	111	102	106	126	93	101	81	84	62	85

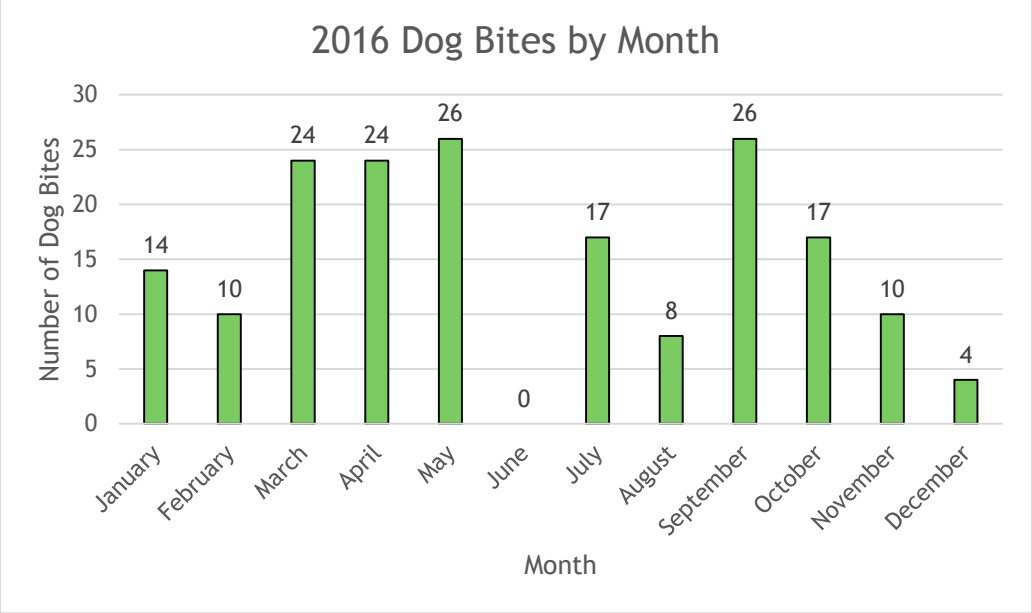
Animal Bite Investigations

Animal bites pose a major public health concern because of the potential to transmit zoonotic disease and cause serious injury. The size and health of both the animal and the person dictates the health impact of each bite incident. Children are the most common victims of animal bites and are more likely to have serious injuries. In addition, animal bites have the potential for transmitting rabies, an almost-always fatal viral infection that attacks the nervous system and brain. For these reasons, animal bites are reportable in the State of Missouri. ACC investigates every bite report and checks rabies vaccination records, tests for rabies, and/or issues quarantine orders to determine whether the animal is free from rabies. Dog are the usual culprits responsible for animal bites in the City of St. Louis. Dog bites account for 96% of the confirmed bites in 2016. Dog bites accounted for 90% of all bites in 2015. ACCOs also investigated bites from cats and bats.

Bites by Animal	**2016**
Dog	180
Cat	7
Bat	1
Total	**188**



Animal bites in 2016 showed a small seasonal trend, as predicted. Most bites occurred during warmer months, between March and September.

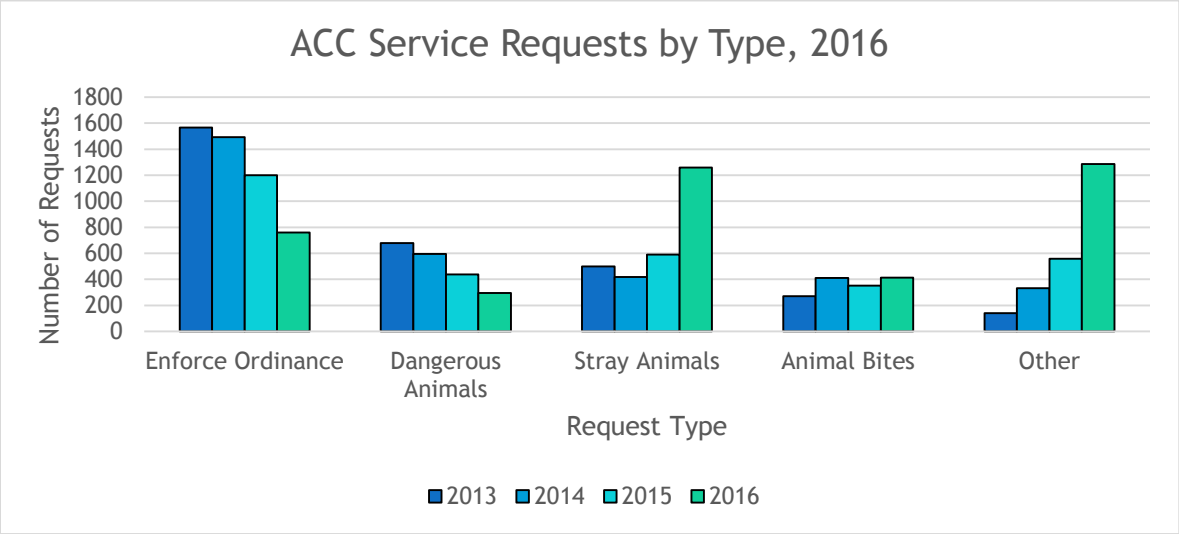


Basic safety tips to prevent a dog bite:

- Remain motionless when being approached
- Do not panic, make loud noises or run
- Avoid direct eye contact, stand with your side facing the dog
- Wait for the dog to pass and remember to be calm

The most routine complaint type for investigation is for ordinance enforcement. Examples include leash law, prohibited animals and residences exceeding the maximum allowable number of pets. In 2016, ACC saw an increase for the number of stray animal complaints received. Other complaint types include animal abuse, complaints to check the welfare of an

animal, a report of an injured or sick animal or to surrender a pet. ACC received 813 complaints for animal welfare check, the second highest complaint type received in 2016.

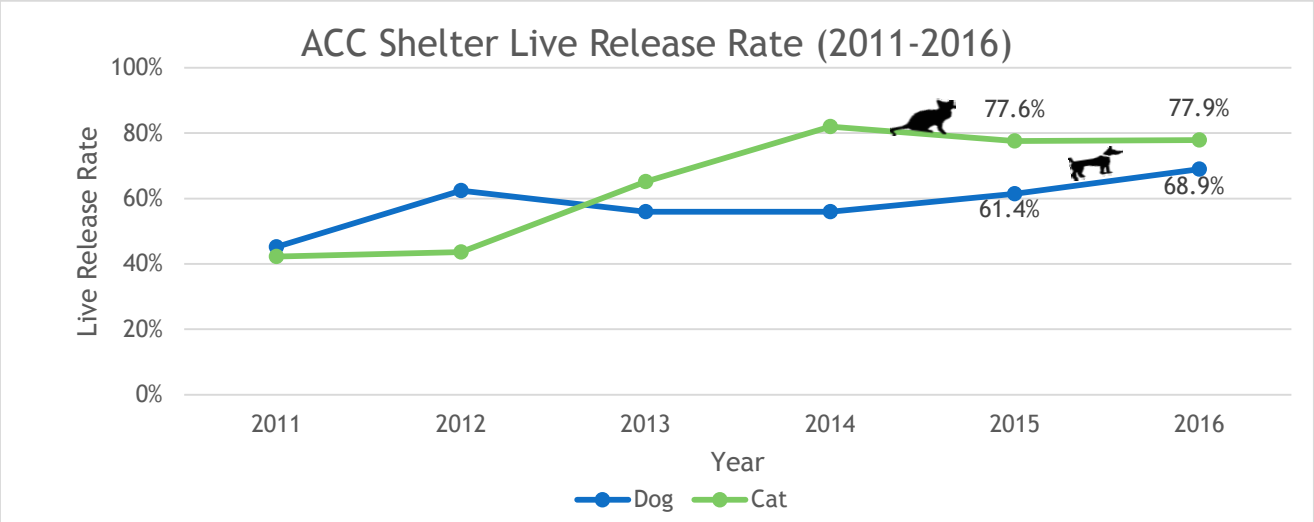


Animal Care and Control Shelter

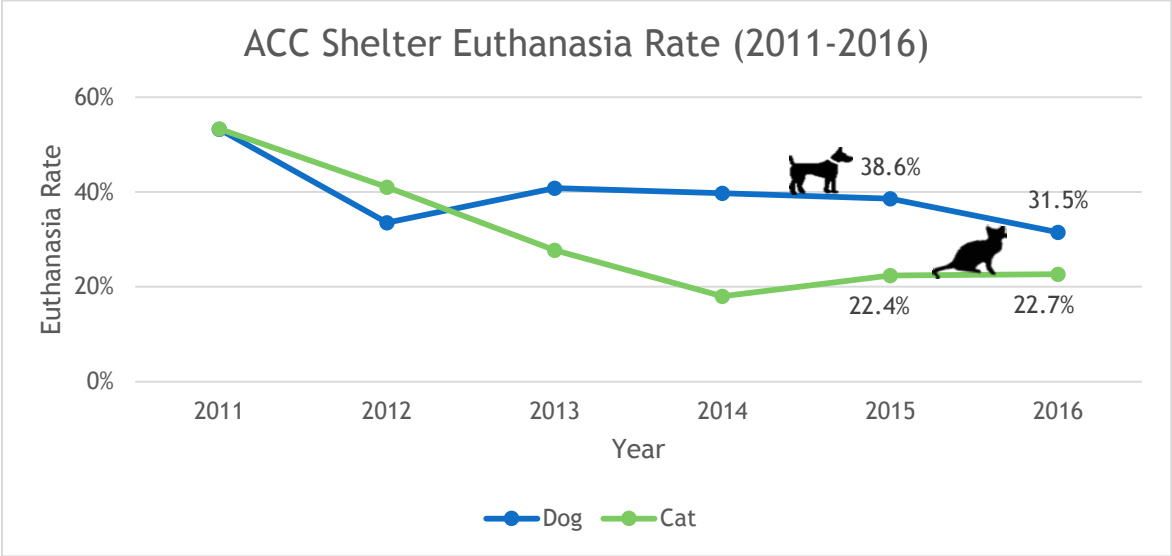
In 2009, the aging ACC shelter facility located on Gasconade Street was identified by the Office of the Mayor and the Department of Health as being obsolete and unable to fully meet the community's needs in providing a safe, healthy, and humane environment for shelter animals. Steps to improve enforcement and sheltering operations were identified, including closing the Gasconade Street facility and opening the ACC shelter on Clark Avenue. Additionally, partnerships with other animal welfare organizations were established to support the goals of:

- Protect the public.
- Guarantee the humane treatment of companion animals.
- Reduce companion animal overpopulation.
- End companion animal abuse.

In 2016, the live release rate for dogs was 68.9%, which was a 12.2% increase from 2015. In 2016, the live release rate for cats was 77.9%, which was very similar to the release rate for cats in 2015.



In 2016, the euthanasia rate for dogs was 31.5%, which was an 18% decrease from 2015. In 2016, the euthanasia rate for cats was 22.7%, similar to the euthanasia rate for cats in 2015.



VECTOR CONTROL

Vector Control

Vectors, or any agents that transmit an infection pathogen to another living organism, can easily transmit disease through animal-to-animal or animal-to-human contact. Mosquitoes are the most commonly known vector, transmitting diseases like West Nile virus, malaria, chikungunya, dengue fever, and more. Some other vectors are flies, ticks and fleas. The diseases caused by vectors make up over 17% of all infectious diseases seen around the world.

There has been an increase in vector-borne diseases in places they were not before due to many factors such as globalization, climate change and rapid urbanization. A key element in prevention of vector-borne diseases, according to World Health Organization, is behavior change. This includes providing education and awareness on protecting oneself from contact with the vectors themselves. These vector-borne diseases can also be controlled or eliminated through preventative measures such as chemical control and removal of harborage conditions.

What We Do

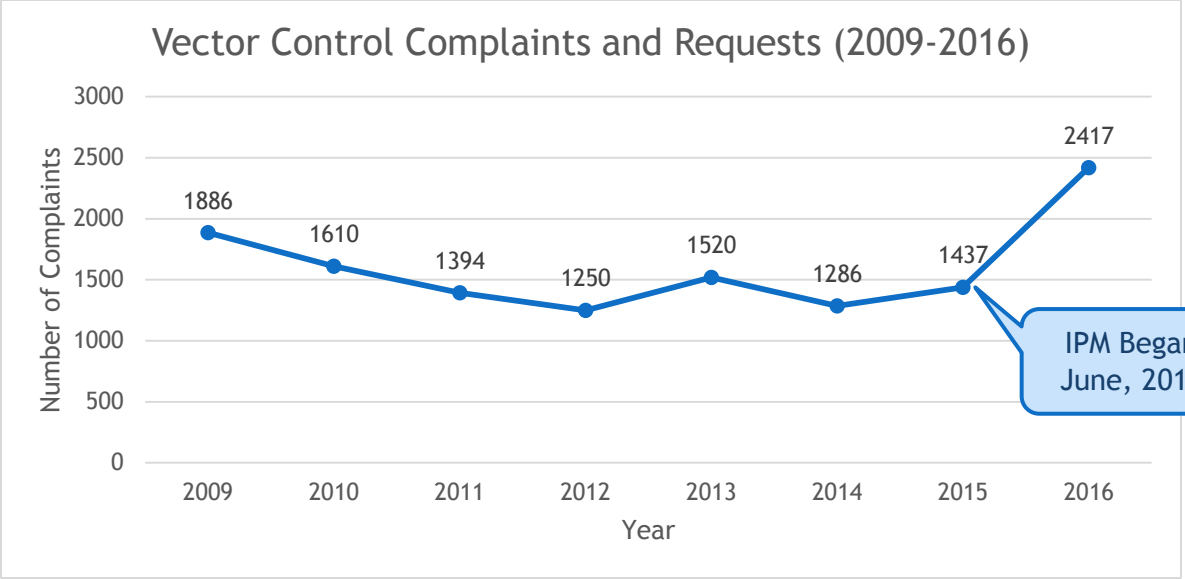
The Vector Control section helps to decrease the number of mosquitoes and rats, both of which spread disease and are considered a nuisance. Pest Control Workers (PCWs) respond to citizen complaints of these disease vectors. PCWs are state-licensed Category 8 public health pest control operators, and are well trained on identifying signs of vector infestations.

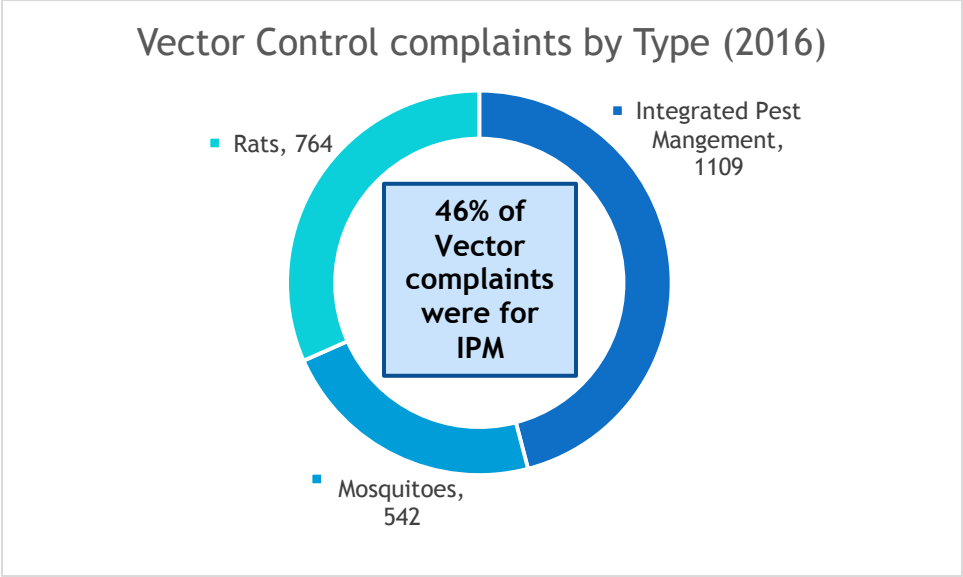
Accomplishments

According to the Centers for Disease Control and Prevention (CDC), Integrated Pest management (IPM) programs reduce the risk from the overuse or inappropriate use of hazardous chemical pest-control products. The three components to IPM are food, water and harborage. Eliminating all three are a requirement of a successful IPM system. Community Sanitation and Vector Control began jointly addressing sanitation and vector complaints to reduce the number of reoccurring problems. Pest Control Workers were trained on local health codes and to conduct initial inspections on complaints for external refuse accumulation and illegal/improper tire storage. If they found rat burrows or mosquito breeding sites, they immediately started treatment and referred the case to an Environmental Health Officer for enforcement. This allowed both treatment of the immediate problem and enforcement actions towards preventing future environmental public health problems.

IPM focuses on pest prevention, pest reduction and the elimination of conditions that lead to pest infestations. Together, both programs were able to focus on the environmental conditions conducive to pests in certain neighborhoods. Both programs conducted inspections and monitored poor environmental conditions but were also able to identify and treat for neighborhood pests. One key component to the IPM procedure was the identification of raw garbage violations.

In 2016, Vector Control addressed 2,417 requests and complaints for mosquito fogging treatments, mosquito breeding sites, exterior rat infestations and IPM exterior sanitation issues. This was an almost 70% increase in complaints dispatched to Vector Control when compared to 2015.



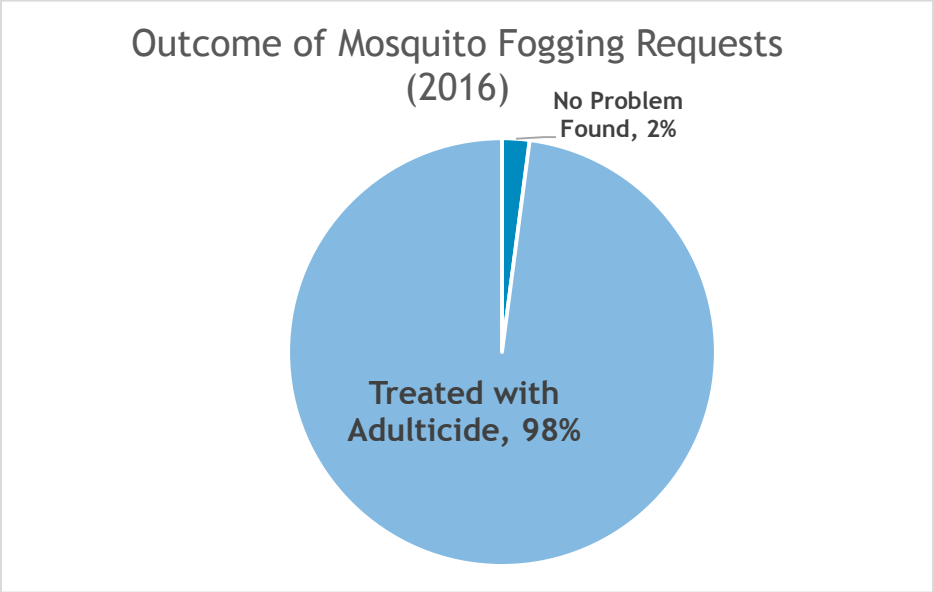


Mosquito Fogging and Breeding

Mosquitoes can carry diseases which threaten the public health, including West Nile Virus, Zika Virus and several forms of encephalitis. In 2016, the United States had almost 900 cases of non-neuroinvasive West Nile Virus Disease (confirmed and probable). In 2016, the City of St. Louis began trapping mosquitoes for speciation. Of the *Aedes* mosquitoes identified, 71% of them were typed as *Aedes albopictus*. In an effort to protect public health, the DOH accepts fogging requests and complaints of mosquito breeding from citizens from May-September annually. However, updates to the current Integrated Pest Management Program will involve more in-depth surveillance for conditions conducive to mosquito breeding when fogging requests are received.

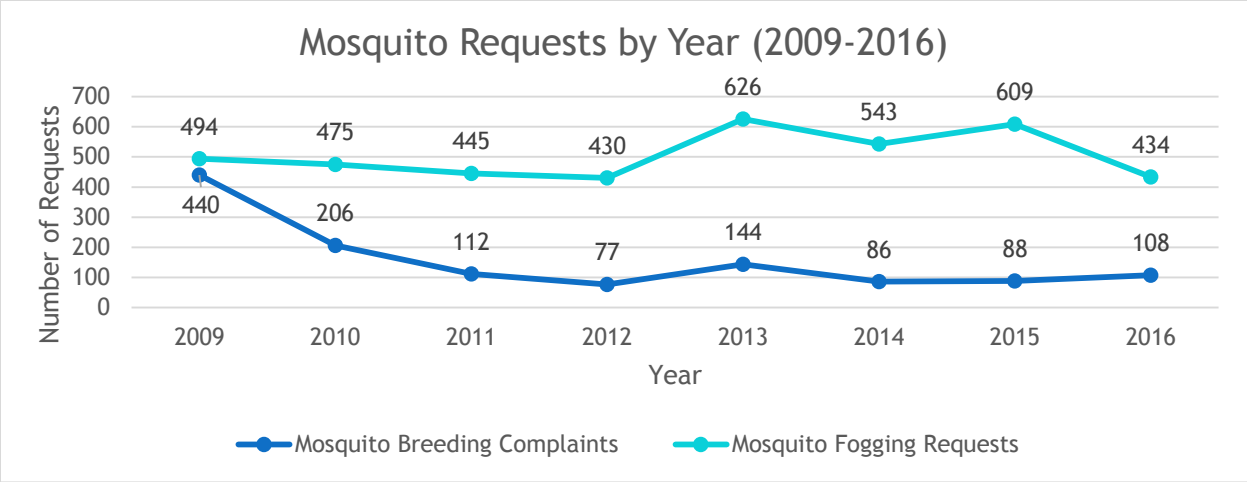
Licensed DOH vector control staff use Aqua-Reslin to spray for adult mosquitoes. The active ingredients in this product are permethrin and piperonyl butoxide. This ultra-low volume

aerosol causes a physical change in the anatomy of the mosquito, resulting in poor flight and feeding ability. As a result, mosquito biting rates decrease significantly. The chronic toxicity of the product was found through studies not to produce a risk until far outside the anticipated human daily consumption and was stated as not indicating a health risk to human beings. The mutagenicity testing resulted in no production of any mutagenic effects. This information was found on the product's material safety data sheet. The product the DOH uses to combat mosquitoes has been found to not pose a health risk to humans. Fogging typically takes place after sunset, which minimizes the impact on butterflies, bees, and other pollinators.

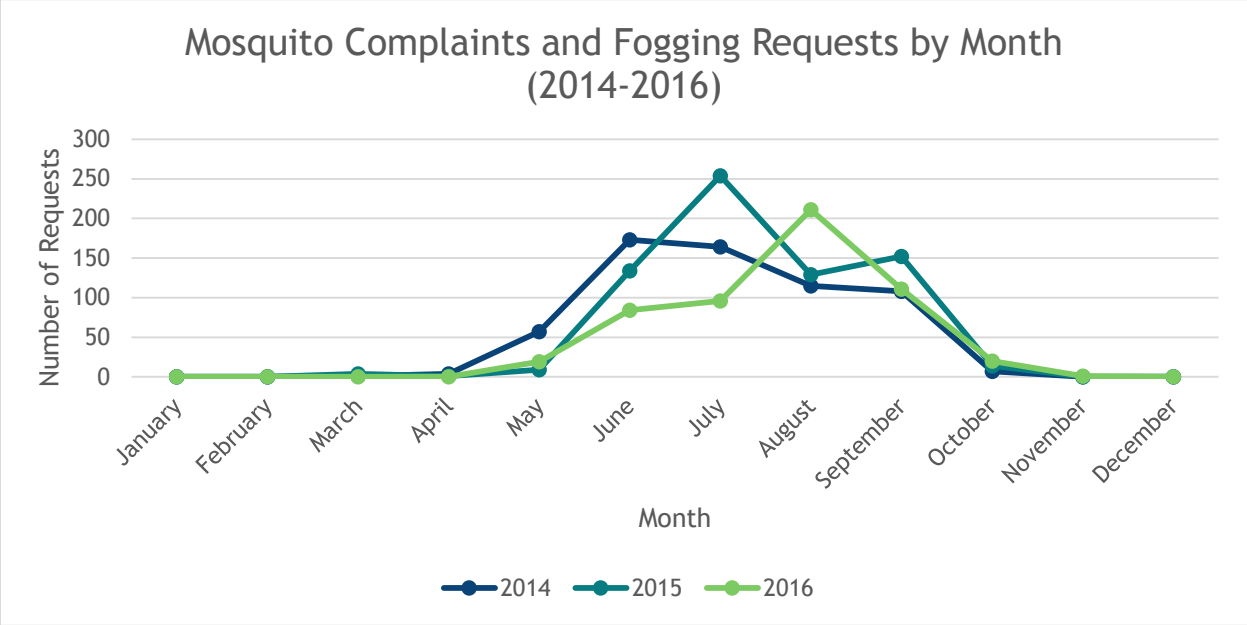


The City of St. Louis parks are routinely treated in the summer months. Aside from that, the Citizens' Service Bureau routes complaints and fogging requests to Vector Control. When the PCWs receive a fogging request for a city block, they review the request, assess the city block, and respond by treating the surrounding 2-block radius. In 2016, 98% of fogging requests were completed. The remainder of fogging requests (6%) were found to have no problem.

Vector Control staff handle complaints about potential mosquito breeding sites and will treat with adulticide if confirmed. While the number of complaints for reported mosquito breeding sites had been steadily decreasing from 2009 to 2012, an increase was seen in 2013 due to heightened awareness and concerns about the West Nile Virus epidemic that hit the United States in 2012. In 2015, concern about the Zika virus most likely caused the increase of breeding complaints, from 88 in 2015 to 108 in 2016. In 2016, only 11% (12 complaints) were confirmed and treated with larvicide. Another 15% were referred to Community Sanitation for enforcement of a potential health violation.

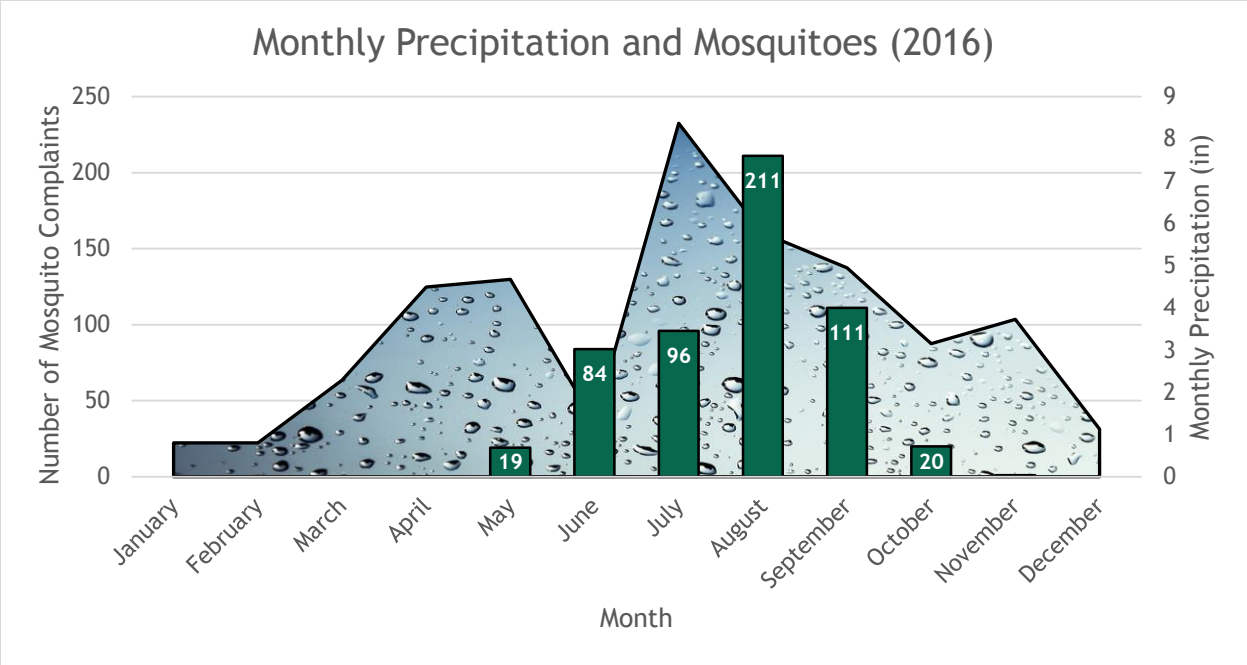


Between 2015-2016, mosquito complaints and fogging requests peaked between June and September. In 2016, complaints peaked in August.



Mosquitoes breed in numerous small pools of water that form following a rainfall. The larvae develop within a few days and escape from the aquatic habitat before it dries out. According to the CDC, it is difficult to predict when and where these temporary breeding sites will form and that larval control may be implemented through source reduction and chemical larviciding. Recommended forms of mosquito control primarily focus on source reduction and personal protective measures, with chemical larviciding and fogging to be used only if necessary.

In 2016, an increase in fogging requests and complaints for potential mosquito breeding sites were seen following an increase in monthly precipitation during the summer months.

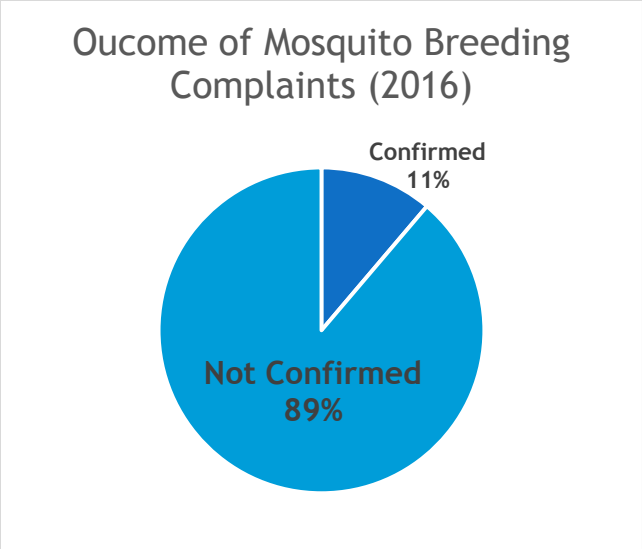


Complaint-Driven Data vs. Investigation-Driven Data

Mosquito control efforts in the City of St. Louis are largely centered on **complaint-driven data**, or reports from citizens. This data source is crucial to identifying specific city areas where citizens are concerned and provides a starting point for DOH staff to investigate the public health concern. However, the majority of complaints are not confirmed due to inadequate burden of proof for a violation, lack of citizen education, or wrong address submission.

The outcome of a complaint results in **investigation-driven data**. DOH staff conduct inspections, document the outcome electronically, and take photographs of the property. If a violation exists, the inspector first notifies the owner, then assesses a fine or sends the owner to court. Investigation-driven data is important for identifying existing areas that pose a significant threat to public health. This type of data can be initiated through a complaint, or DOH staff can self-initiate investigations while performing routine duties.

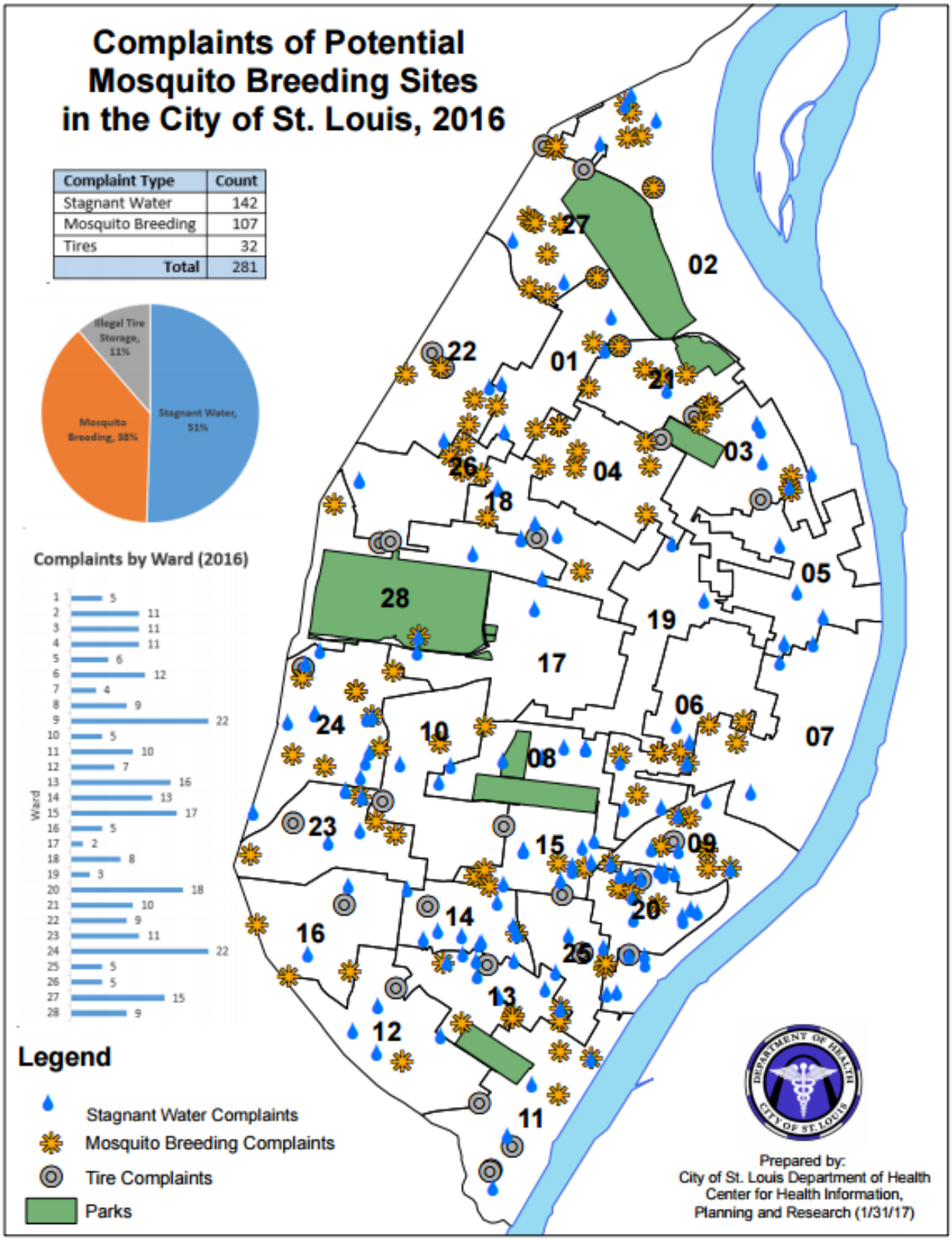
Primary use of either complaint-driven or investigation-driven data can lead to underrepresentation of public health concerns and low percentage of confirmed outcomes. When examined together, complaint-driven data gives information on where most citizens are concerned while investigation-driven data shows identification, location, and severity of the public health problem. The limitation to investigation-driven data is that it is initiated in areas where complaints are made. If complaints are not generally made in a specific area, investigation-driven inspections will most likely not occur.

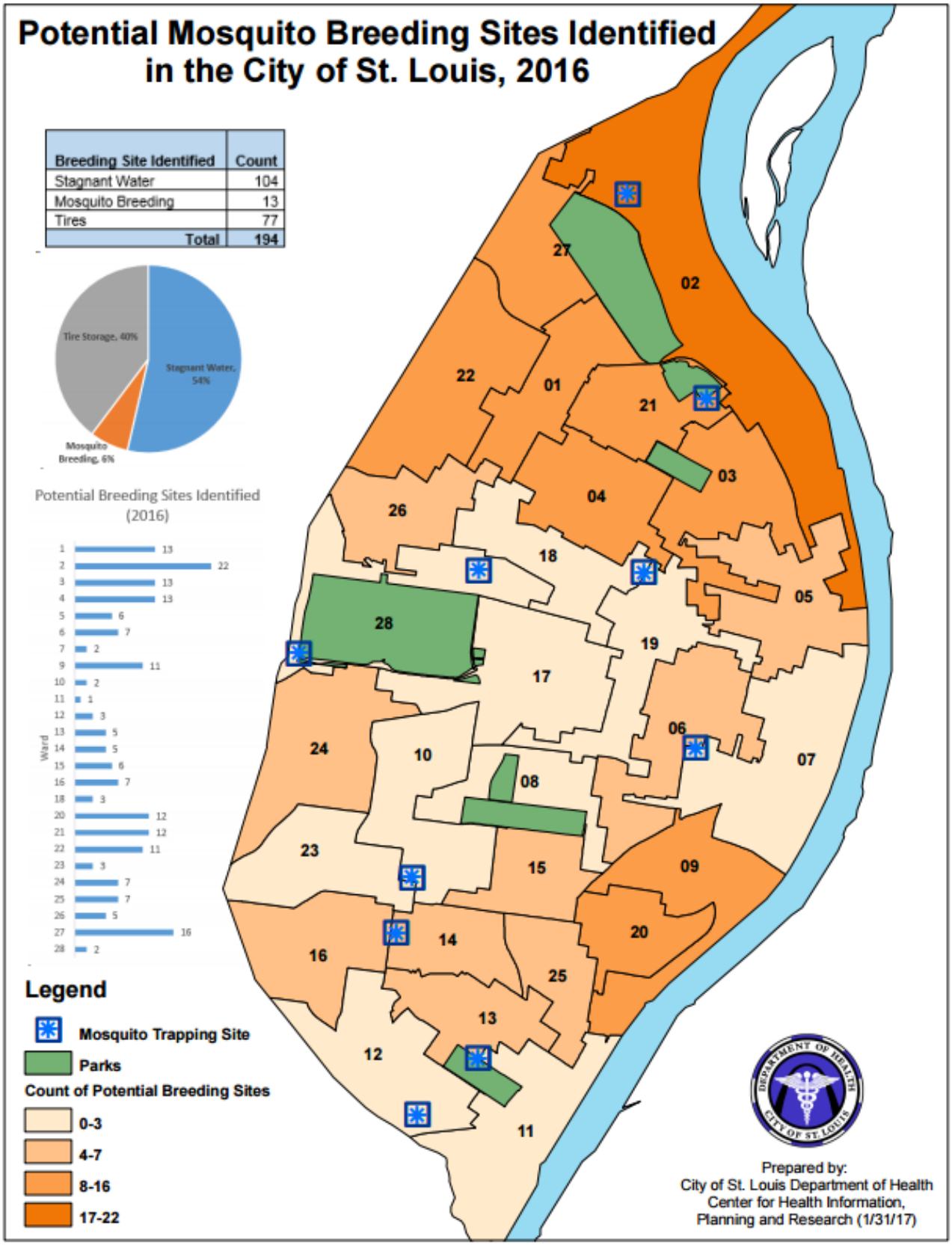


In 2016, complaint-driven data showed 281 complaints of potential mosquito breeding sites. Stagnant water accounted for 51% of complaints, while mosquito breeding accounted for 57% of complaints. Wards 9, 24 and 20 were the top three wards with potential breeding site complaints.

In 2016, investigation-driven data identified 194 potential breeding sites. Stagnant water accounted for 54% of the sites and illegal or improper tire storage accounted for 40% of the sites. The majority of sites were identified in Wards 2, 27, 1, 3 and 4 (all northern wards).

Together, the two types of data provide a meaningful picture when assessing the abundance of mosquito breeding areas and the need for education on source reduction. This can advise future mosquito control intervention programs to reduce the spread of mosquito-borne illnesses. This type of data can also provide a baseline for mosquito trapping and surveillance programs within the integrated pest management program.


Complaints of Potential Mosquito Breeding Sites in the City of St. Louis, 2016
Complaint Type | Count
Stagnant Water | 142
Mosquito Breeding | 107
Tires | 32
Total | 281
Illegal Tire Storage, 11%
Stagnant Water, 51%
Mosquito Breeding, 38%
Complaints by Ward (2016)
Ward
1 5
2 11
3 11
4 11
5 6
6 12
7 4
8 9
9 22
10 5
11 10
12 7
13 16
14 13
15 17
16 5
17 2
18 8
19 3
20 18
21 10
22 9
23 11
24 22
25 5
26 5
27 15
28 9
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
Legend
Stagnant Water Complaints
Mosquito Breeding Complaints
Tire Complaints
Parks
Prepared by:
City of St. Louis Department of Health
Center for Health Information,
Planning and Research (1/31/17)


Potential Mosquito Breeding Sites Identified in the City of St. Louis, 2016
Breeding Site Identified | Count
Stagnant Water | 104
Mosquito Breeding | 13
Tires | 77
Total | 194
Tire Storage, 40%
Stagnant Water, 54%
Mosquito Breeding, 6%
Potential Breeding Sites Identified (2016)
Ward
1 13
2 22
3 13
4 13
5 6
6 7
7 2
9 11
10 2
11 1
12 3
13 5
14 5
15 6
16 7
18 3
20 12
21 12
22 11
23 3
24 7
25 7
26 5
27 16
28 2
Legend
Mosquito Trapping Site
Parks
Count of Potential Breeding Sites
0-3
4-7
8-16
17-22
01
02
03
04
05
06
07
08
09
10
11
12
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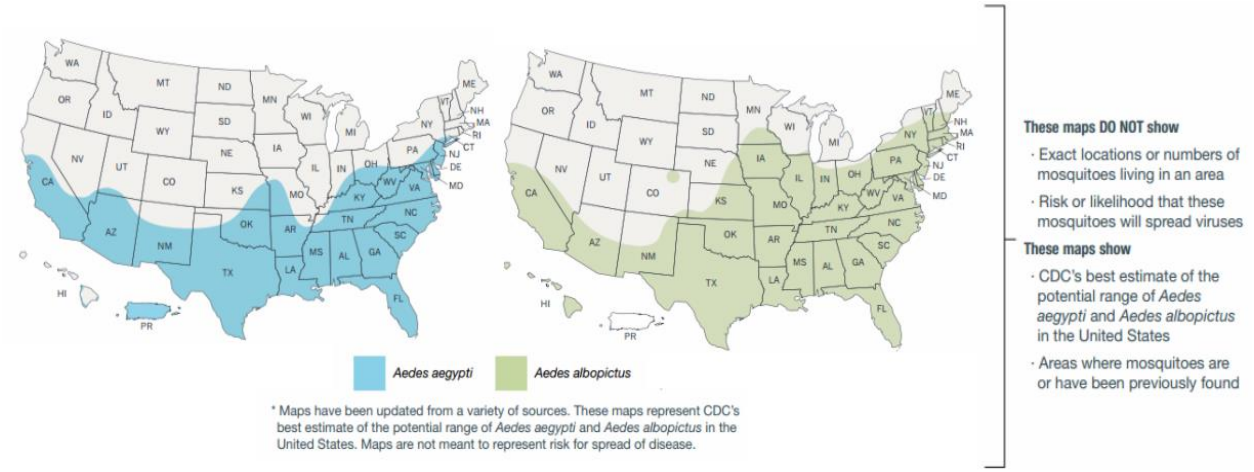
Prepared by:
City of St. Louis Department of Health
Center for Health Information,
Planning and Research (1/31/17)

Zika Virus Disease

Zika is an emerging mosquito-borne virus causing disease. Zika virus was first discovered in 1947 in Uganda in a monkey with a mild fever. Nonhuman primates have shown the ability to become infected with the virus, but at this time there have been no reports of Zika virus disease in pets or other animal types or their involvement in the transmission of the Zika virus. Beginning in the summer of 2016, presumed local transmission began in Florida, and around November, 2016 in Texas. Most people infected with Zika virus will not show clear symptoms. When symptoms present they may last several days up to a week. Zika infection is confirmed through a blood or urine test and there is no treatment or vaccine.



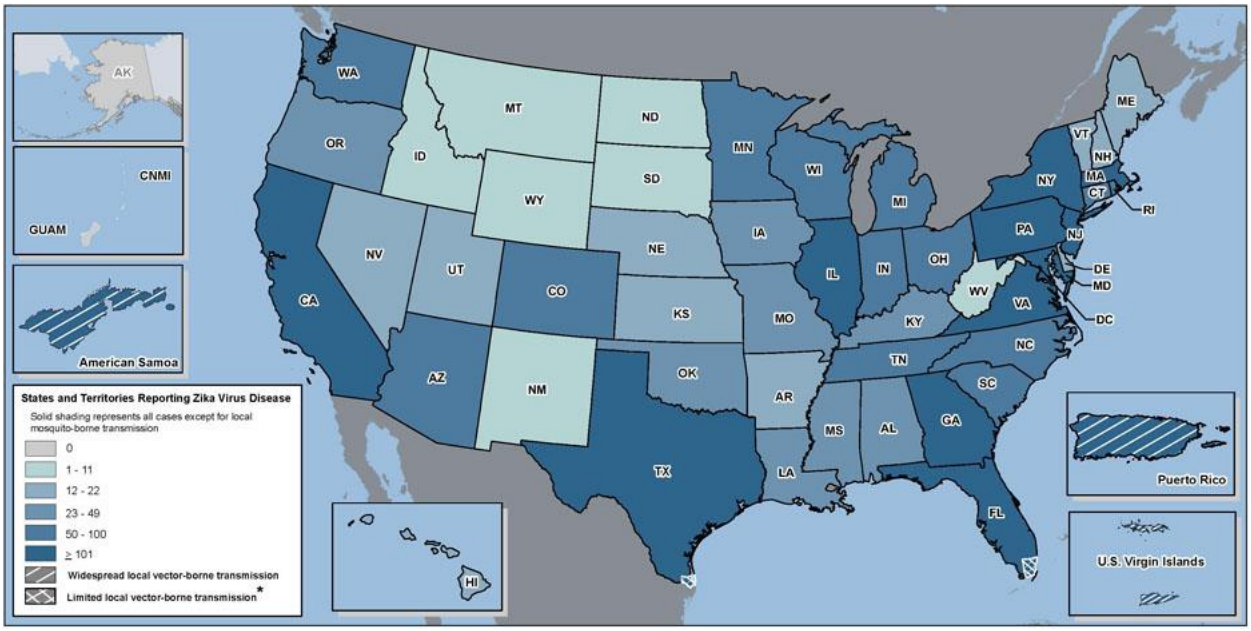
Map Source: http://www.cdc.gov/zika/pdfs/zika-mosquito-maps.pdf

Zika virus is primarily transmitted to humans through the bite of an infected mosquito from the *Aedes* species, mainly *Aedes Aegypti* and *Aedes albopictus*. The estimated range of *Aedes albopictus* does include the City of St. Louis. Sexual transmission of Zika virus is possible, but use of condoms reduces the chance of getting Zika. A pregnant woman can transmit Zika virus to her fetus during pregnancy. Zika virus can also be transmitted through blood transfusion, but there are no confirmed transfusion transmission cases in the United States. A person can transmit the virus even if they are not experiencing symptoms.

Zika virus is the first known mosquito-borne disease to cause birth defects. One severe defect is microcephaly, when congenital Zika infection leads to a smaller brain that may not be fully developed. Zika virus during pregnancy is shown to cause an increased chance for microcephaly defect. Some infants with congenital Zika infection will not develop microcephaly but may show slowed head growth with a delayed microcephaly. Microcephaly complications include developmental and intellectual delay or disability, hearing loss and vision problems. Problems could be lifelong depending on the severity of the microcephaly. Other complications could include miscarriage and stillbirth, both reported to women with laboratory evidence of Zika virus infection. Infection during the first trimester may pose the highest risk. In addition, Zika virus is associated with a recent increase in incidence of Guillain-Barré syndrome, a condition in which the body's immune system attacks the peripheral nervous system.

As of April 26, 2017, there have been 5,264 Zika virus disease cases reported within the United States. 4,963 of the total number of cases are travel related. Of the 4,963 cases, 224

are locally acquired cases in Florida and Texas only and 77 cases were acquired through other routes (sexually transmitted, congenital infection, laboratory transmission). There have been 38 symptomatic travel-related cases in Missouri. The map below displays Zika cases reported in the United States and territories and the two areas with active Zika transmission (Miami-Dade County, Florida and Brownsville, Texas).



Map Source: http://www.cdc.gov/zika/geo/united-states.html

All persons traveling to areas with active Zika transmission should prevent mosquito bites and practice safe sex. Because Zika virus can be spread from a pregnant woman to her fetus along with the risk of birth defect, the Centers for Disease Control and Prevention (CDC) recommends pregnant women should consider delaying travel to areas with risk of Zika. Those traveling to an area with risk of Zika should consider abstaining from sexual activities while traveling or use condoms consistently and correctly. Women who are pregnant should do so for the duration of the pregnancy. Couples should take into consideration that most infections are asymptomatic when illness does occur. Pregnant women who experience any of the symptoms or have a partner who has symptoms consistent of Zika virus infection should talk to their doctor. Diagnostic testing may be necessary. As a precautionary measure, those that have traveled to areas with the Zika virus should continue to take steps to prevent mosquito bites even after they have returned from travel.

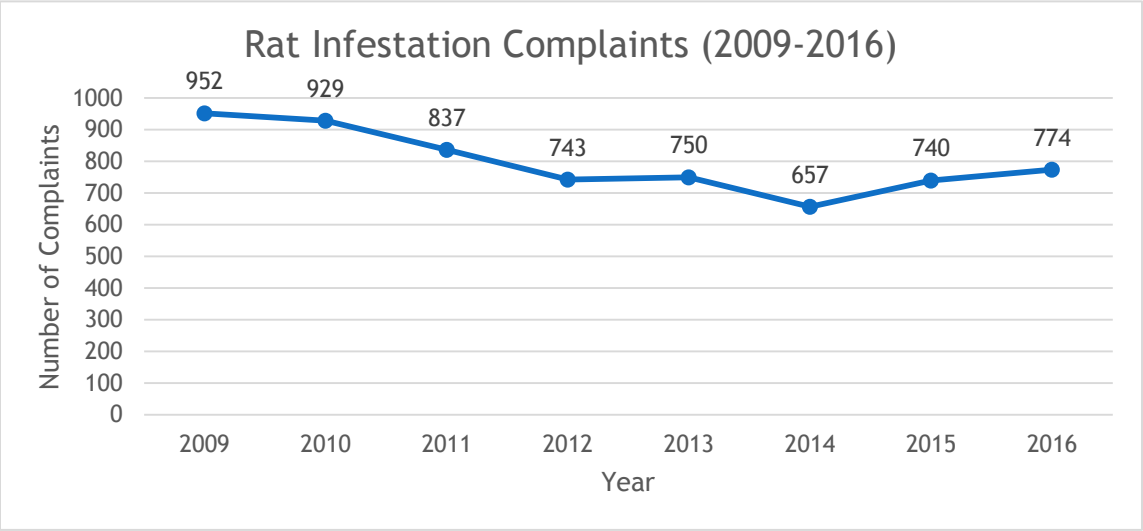
The City of St. Louis Department of Health (DOH) follows the current recommendations from the CDC and is working closely with the State of Missouri and health care providers to facilitate testing approval. The DOH is asking healthcare providers to be alert for Zika virus infection symptoms and to actively report cases. In efforts to protect the public, the DOH is preparing to expand the current mosquito control program by increasing education around "Fight the Bite" and fully implementing the integrated mosquito management program as we enter mosquito season. In an effort to fight mosquito bites, DOH is encouraging citizens to drain or treat standing water with larvicides, remove abandoned tires and submit mosquito breeding complaints and fogging requests.

External Rat Infestation

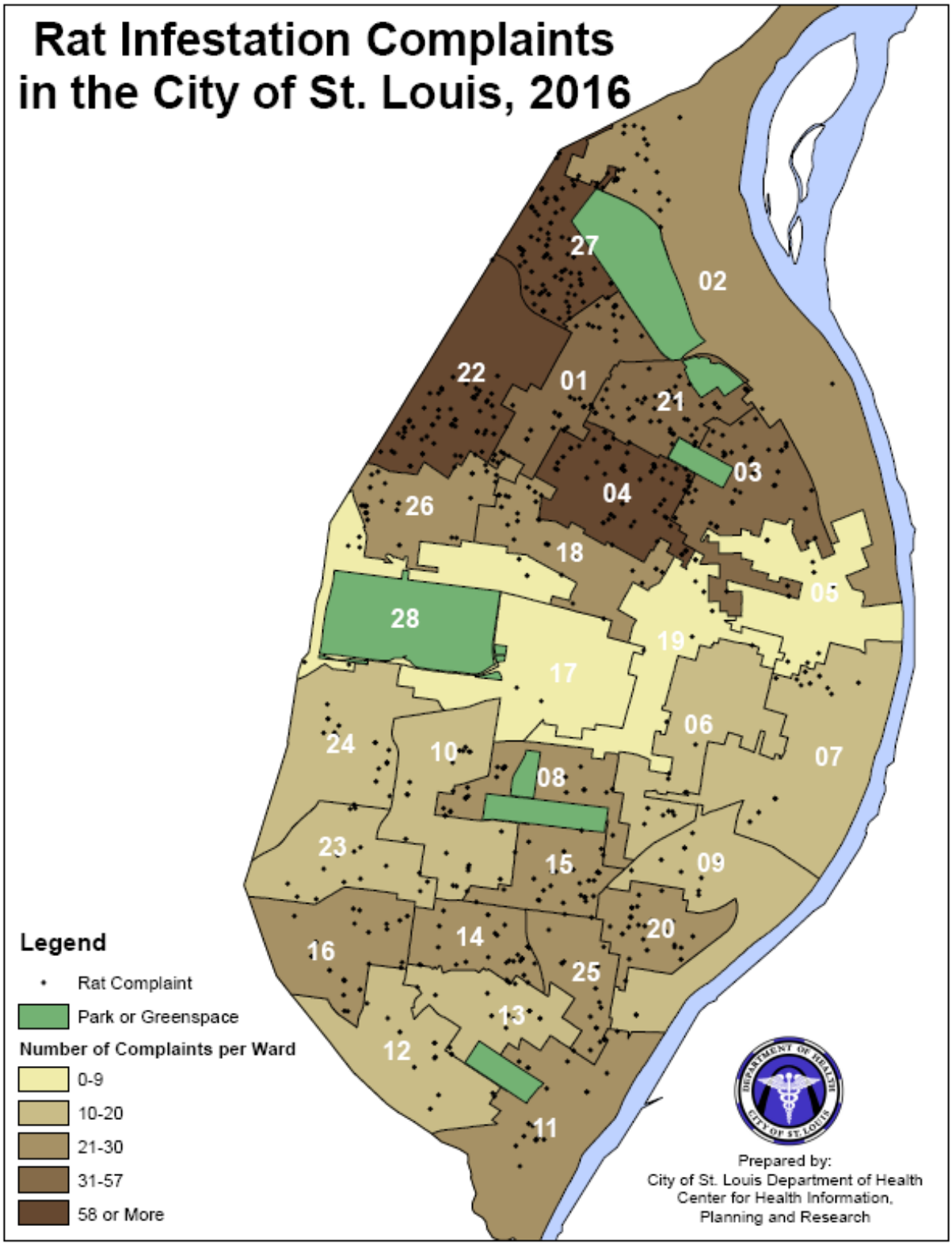
Rats can transmit a number of diseases which can be potentially fatal to man, such as Weil's disease. Rats also carry disease organisms such as *Salmonella* bacteria and other viruses. Rats can be the reservoir for pathogens that can then transmit via vectors like fleas. In urban areas rats readily find food from a variety of sources such as refuse from commercial kitchens and restaurants, discarded takeaway food in addition to scavenging in domestic refuse or in drains and sewers. Their feeding, foraging, and nesting behaviors are considered a nuisance in the City of St. Louis. It is easy for infestations to build up without noticing a rat. Signs of an infestation may include droppings, gnaw marks, runs, and smear marks produced by the continual rubbing of their fur against surfaces. In order to protect public health from this environmental threat, the DOH recommends removing any outdoor conditions that provide harborage or food sources.

The Vector Control section works to address exterior rat infestations based on complaints received from the Citizens' Service Bureau. The PCWs investigate for signs of rat colonies, evaluate the environment for harborage conditions, and treat infested areas appropriately. The DOH uses a single-feeding anticoagulant with bromadiolone to treat rat infested areas. This is a USDA-approved rodenticide that kills Norway rats, warfarin-resistant Norway rats, and roof rats. Careful attention is given to the placement of bait, to prevent mammals, birds, dogs, cats, and other animals from accidental ingestion. For this reason, the bait is not placed openly above ground or applied directly to water sources.

The number of rat infestation complaints have increased 4.5% since 2015. Only about 13% are confirmed. Of the 87% not confirmed, 159 were referred to Community Sanitation through the IPM program. Referred complaints were for conditions conducive to rat infestations (refuse, improperly stored items, etc.).



In 2016, there were 764 complaints received for rats on the exterior. Rat complaints were observed more in the northern portion of the City but overall observed throughout.



EMERGENCY PREPAREDNESS

Overview

This report describes the Emergency Preparedness Program and its 2016 activities. Program partners with City of St. Louis local government agencies and departments, private and public sectors, faith-based groups, families and individuals to prepare City of St. Louis organizations and citizens to respond to and recover from emergency events that can affect the public's health. Our activities are primarily funded by grants from the Missouri Department of Health and Senior Services.

Local focus with regional coordination

Emergencies occur at the local level, yet they know no jurisdictional boundaries.

Emergency Preparedness collaborates closely with neighboring public health agencies and the regional healthcare coalition to share best practices, expertise, coordination, and training opportunities.

Responding to large-scale events can require resources beyond those available to local governments. DOH enlists and engages agencies and partners to plan together to share resources, avoid duplication of effort and work toward common goals. Emergency Preparedness program activities are directed toward meeting the national standards set by the CDC and ASPR. Each agency has outlined a set of capabilities, 15 from the CDC and eight from ASPR, that guide the work of their grantees at both the state and local levels.

What we do

Public health threats are always present. Whether caused by natural, accidental, or intentional means, these threats can lead to the onset of public health incidents. Being prepared to prevent, respond to, and rapidly recover from public health threats is critical for protecting and securing our nation's public health.

The 2009 H1N1 influenza pandemic underscored the importance of communities being prepared for potential threats. However, state and local public health departments continue to face multiple challenges, including an ever-evolving list of public health threats. Regardless of the threat, an effective public health response begins with an effective public health system with robust systems in place to conduct routine public health activities. In other words, strong state and local public health systems are the cornerstone of an effective public health response.

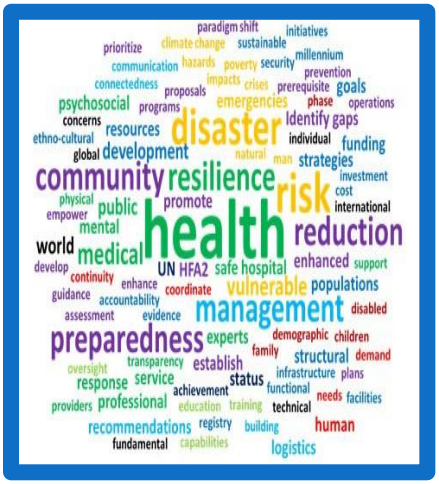
For guidance in planning and response efforts, the DOH relies on the Centers for Disease Control's (CDC) Public Health Capabilities recommendations which are designed to accelerate local preparedness planning, and, ultimately, assure safer, more resilient, and better prepared communities. These 15 Capabilities serve as the foundation for DOH preparedness endeavors.

The Centers for Disease Control and Prevention has identified the following 15 public health preparedness capabilities as the basis for state and local public health preparedness:

1. Community Preparedness
2. Community Recovery
3. Emergency Operations Coordination
4. Emergency Public Information and Warning
5. Fatality Management
6. Information Sharing
7. Mass Care
8. Medical Countermeasure Dispensing
9. Medical Materiel Management and Distribution
10. Medical Surge
11. Non-Pharmaceutical Interventions
12. Public Health Laboratory Testing
13. Public Health Surveillance and Epidemiological Investigation
14. Responder Safety and Health
15. Volunteer Management

The 15 capabilities are intended to serve as national standards that local public health departments can use to advance their preparedness planning.

The Public Health Emergency Preparedness program is charged with demonstrating measurable and sustainable progress toward achieving the public health preparedness capabilities and to promote prepared and resilient communities.



Today, public health systems and the respective preparedness programs face many challenges. While federal funds for preparedness have been declining over the past few years causing state planners to express concerns over their ability to sustain the real and measurable advances made in public health preparedness since September 11, 2001, the state of Missouri has continued to provide stable and relatively level funding to local jurisdictions in support of local public health preparedness. The City of St. Louis Department of Health (DOH) works diligently to prioritize and ensure that federal and state dollars are directed to priority areas within our jurisdiction.

Accomplishments

Zika

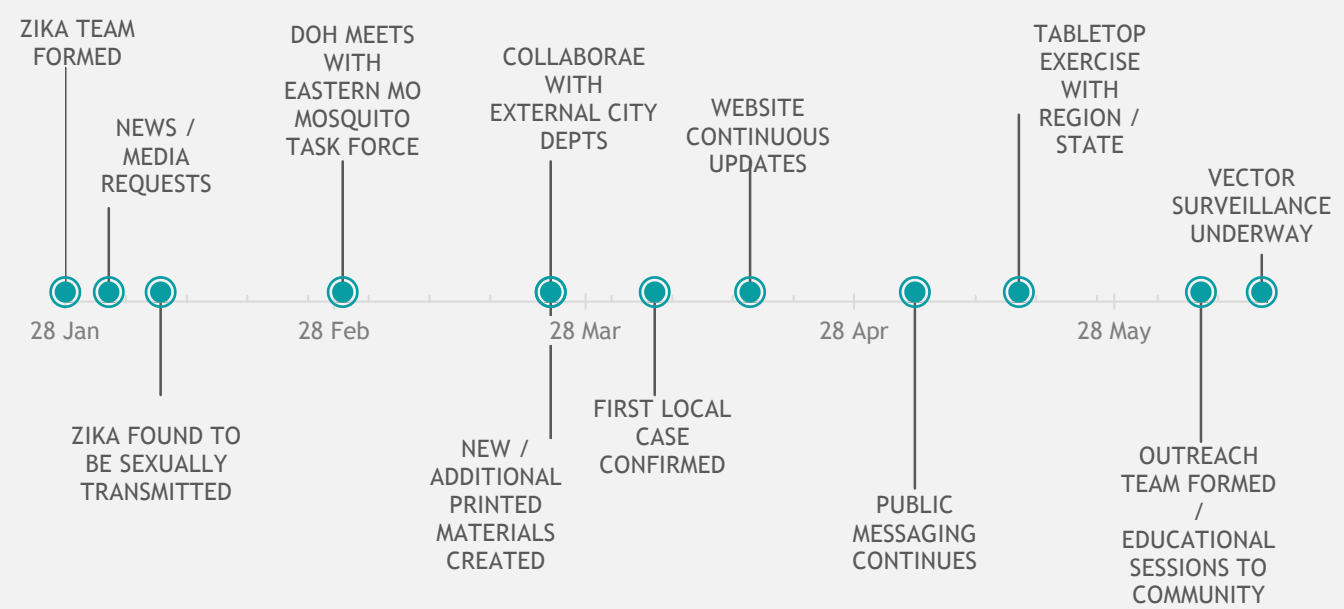
As of December, 2016, the Centers for Disease Control (CDC) reported nearly 4800 cases of travel-associated Zika virus in the United States and DC. In addition, the CDC announced the number of Zika cases among pregnant women with Zika infection rose to 1,394. Local transmission has been seen in Florida and Texas. While the natural range of the Zika-carrying mosquito A. egypti poses the greatest immediate threat to our southern states, the fact remains that there are confirmed Zika cases in virtually every single state. Missouri is home to the A. albopictus mosquito which is also a known vector for Zika virus. As is the case with many more central and some northern states, the threat of local transmission of the virus is

serious. Studies suggest that Zika is anticipated to spread, with as many as 200 million people in our country living in areas where mosquitos that carry the virus could potentially thrive.

The Department of Health Response

Beginning in January of 2016, the DOH began formulating its plan for activities around addressing the Zika virus. Our actions include the following:

- 12-member team from the department formed
- 1 Subject Matter Expert designated for press releases / media interviews
- 3-pronged approach determined: Disease investigation, environmental surveillance, and public messaging



EBOLA and Emerging, Highly Infectious Diseases

Ebola

As attention shifted to focus on the threats of the Zika virus, new studies have brought insight to ongoing efforts to combat the deadly Ebola virus that threatened countries in West Africa, and still potentially threatens the global community. More is being learned on the lingering effects of the virus. More than 28,600 people were infected with Ebola in West Africa during the outbreak. Of that number, 11,300 died. Researchers are studying Ebola survivors to find out more about possible continued long-term neurological and other health problems for the more than 17,000 survivors of the infection.

The Department of Health Response

A competitive grant – the Ebola Preparedness Grant – was secured through the Missouri Department of Health and Senior Services to continue the efforts around Ebola which began in the fall of 2014. The following description of activities summarizes DOH's on-going efforts regarding Ebola and emerging infectious diseases:

Goal: Develop a network of partnerships among urgent care/retail clinics, LPHAs, and the Regional Healthcare Coalition.

Objectives: Provide technical assistance, expertise, and advice to regional LPHAs regarding how to strengthen the relationships with urgent care and walk-in clinic staff to assure that these sites are prepared to:

- Identify patients exposed to or symptomatic of highly infectious diseases
- Isolate identified patients
- Initiate appropriate local/regional notification protocols
- Utilize best practice for patient transportation

Activities

1. Provide technical assistance to identify urgent care sites/retail walk-in clinics to be involved in this project.
2. Provide technical assistance to determine urgent care sites'/retail walk-in clinics' preparedness maturity levels and gaps, including
   - · Competence and capacity development
   - · Information sharing for situational awareness and the receipt and transmission of critical information exchange with state and LPHA.
3. Provide expertise and facilitate access to education and training resources to address competence and capacity development needs, including a formalized section of the HC Learning Management System to include a curriculum portal: www.eehid.com
4. Provide expertise and recommendations regarding methods to strengthen partnerships among these sites and LPHAs and to encourage sites to serve as part of the surveillance network for the LPHAs.
5. Host a conference /workshop (September, 2016) to strengthen partnerships and provide platform for sharing of best practices and infectious disease updates and guidance in urgent care and outpatient settings.

6. Provide expertise to identify policy and procedure templates and checklists associated with the management of exposed or symptomatic patients.

The City of St. Louis Department of Health (DOH) conducted multiple meetings and workshops across the region with our public health partners and healthcare providers in efforts to prepare our community for the possible arrival of Ebola virus. When surveyed, 100% of DOH partners responded in favor of additional meetings with their local health department to discuss latest guidance, best practices, lessons learned on specific / special topics such as Ebola.

Other Infectious Diseases

In addition to the grant secured through the Missouri Department of Health and Senior Services, a second competitive grant was awarded to our Emergency Preparedness Program through the National Association of City and County Health Officials (NACCHO) – LINC Initiative: Lessons in Infection Control.

Perhaps most satisfying in receiving this grant is the dove-tailing of LINC activities with DOH current work plans under the existing Ebola Preparedness grant. While working on assessment and capacity building in the community around issues of emerging diseases, it is highly satisfying to have the opportunity to mirror those efforts internally.

The activities outlined in the LINC grant application underscore the DOH commitment to strengthening internal capacity to effectively respond to outbreaks of Ebola, healthcare-acquired infections, and other emerging infectious diseases. The LINC program activities touch upon the following focus areas:

1. Assess the LHD's competencies and capabilities in infection control
2. Strengthen internal coordination across agency departments
3. Improve collaboration across state and local public health, healthcare, and other sectors
4. Plan and implement training and professional development opportunities for LHD staff.

Medical Countermeasures

Intentional and natural disease outbreaks in the United States, beginning with the 2001 anthrax attacks followed by the 2009 Novel H1N1 global pandemic have focused increased attention on the continued need for local public health authorities to provide affected individuals and communities with rapid, reliable access to prophylactic medications. In light of the substantial health risks posed by anthrax, influenza, and other bacteria, spores, toxins, or viruses, local public health jurisdictions have been called upon to develop comprehensive mass prophylaxis plans to ensure that their citizen populations have timely access to necessary antibiotics and/or vaccines – medical countermeasures – in the event of future outbreaks or bioterrorism events.

The City of St. Louis Department of Health (DOH) tracks progress toward ensuring capacity to provide medical countermeasures in a timely fashion by building capability around the "worse-case scenario" which mandates delivery of medication to combat an intentional category A agent release within 48 hours of the event to the entire jurisdictional population.

The metrics that reflect DOH's capacity for delivery of medical countermeasures are updated and presented to the CDC's Strategic National Stockpile program on an annual basis.

City of St. Louis Medical Countermeasures Jurisdictional Profile (2015 – 2016)	
Local population covered by dispensing plan:	318,416
# hours for dispensing operations	24
# of Open PODS required	9
Population served by Open PODS	127,710
Hourly thru-put at Open PODS	285 persons / hour
Population served by Closed PODS	180,957
# Closed PODs with healthcare entities / agencies (e.g. nursing homes, long term care facilities)	17
# Closed PODS with private business	8
# Closed PODS with governmental agencies (e.g., juvenile programs, corrections centers)	6
# Closed PODS with universities	1
# Closed PODs with community-based agencies	4
Population served by Alternative Dispensing Modalities	9,750
# Alternative Dispensing Modalities	1
Medical Countermeasures planning has incorporated the following at-risk populations:	
☑ Those who have disabilities	
☑ Those who live in institutional settings	
☑ Those who are from diverse cultures	
☑ Those who have limited English proficiency	
☑ Those who are non-English speaking	
☑ Those who are transportation disadvantaged	
☑ Those who have chronic medical disorders	
☑ Those who have pharmacological dependencies	

Severe Weather Protection Program and Community Resilience

As outlined in the National Health Security Strategy and Implementation Plan, published by the Assistant Secretary for Preparedness and Response (ASPR), community resilience is a community's sustained ability to withstand, adapt to, and recover from adversity. The Emergency Preparedness Program is actively engaged in this multisector endeavor that leverages community and individual assets, such as infrastructure, talents, skills, relationships, technology, and natural resources. Because health is a key aspect of overall community resilience, the scope of our efforts around severe weather protection includes **community** health resilience.

The Emergency Preparedness Program promotes community health in part by engaging with and supporting partners working on community infrastructure, including secure housing, economically viable neighborhoods, quality healthcare facilities, and spaces for gathering and exercise. Under this model, public health, healthcare, behavioral health, and social service organizations work together to understand the needs of the people they serve and be ready to meet those needs before, during, and after an incident, with the belief that as individuals and organizations become more health-resilient and build robust social networks, whole-community resilience will thrive.

Priorities of this program include:

1. Improving social connectedness
2. Enhancing coordination of health and human services through partnerships and other sustained relationships
3. Building a culture of resilience by promoting physical, behavioral health, and social health; leveraging health and community systems; and increasing access to information and training to empower individuals and their communities

Severe Weather/Community Resilience partners with the Department of Human Services in efforts to promote, build, and utilize the City's Functional Needs Registry. Currently, approximately 4,000 at-risk individuals are registered with the City to receive information and services during emergency events.

Severe Weather/Community Resilience also partners with HeatUp/CoolDown St. Louis offering grant management assistance. HeatUp/CoolDown St. Louis offers utility assistance to vulnerable families. Annually, this organization reaches approximately 1,500 households.

Outreach and education is performed throughout the year, reaching over 20,000 individuals annually.

Exercises and Training

The City of St. Louis Department of Health's (DOH) multiyear training program is our roadmap to reach an accomplished level of readiness / preparedness around the 15 public health capabilities. DOH has pursued a coordinated strategy that combines enhanced planning, new equipment purchases, innovative training, and realistic exercises to strengthen their emergency prevention and response capabilities. Training and exercises play a crucial role in this strategy, providing DOH with a means of attaining, practicing, validating, and improving new capabilities.

The DOH multiyear plan employs a building-block approach in which training and exercise activities focus on specific capabilities in a cycle of escalating complexity.

The training and exercise schedule is frequently updated and refined at least annually, but may be adjusted as new information becomes available. For example, lessons learned from actual incident responses may point to the need to add training. Similarly, exercise After Action Reports (AARs) may require modification to the exercise schedule at any time. Finally, as the Region and State agree to coordinate training and exercise priorities, cooperation with their broader strategies may point to the need for adjusting our training / exercising, in terms of content or schedule.

The department's priorities for training and exercises are:

- Achieving readiness level public health capabilities
- Strengthening ESF-8 support capabilities
- Implementing the National Response Framework and National Incident Management System
- Expanding regional collaboration

The DOH incorporates real world events into our training and exercise program by ensuring that the event is fully utilized in teaching us about response activities. Emergency Preparedness staff write After-Action Reports that are compliant with Homeland Security Exercise and Evaluation Program following each exercise and real world event that focuses on an emergency response, or incorporates an activity that might be utilized in a disaster event.

In 2016, the DOH hosted or participated in exercises or real events that included the following scenarios and touched upon corresponding public health capabilities:

Active Shooter

Emergency Operations Center
Public Information and Warning
Responder Safety and Health
Information Sharing
Community Preparedness

Zika Virus

Public Information and Warning
Information Sharing
Surge Capacity
Non-Pharmaceutical Interventions
Public Health Laboratory Testing
Surveillance and Epidemiologic Investigation

Alternate Care Sites

Mass Care
Information Sharing
Community Preparedness
Surge Capacity

Rabbit Fever/Tularemia

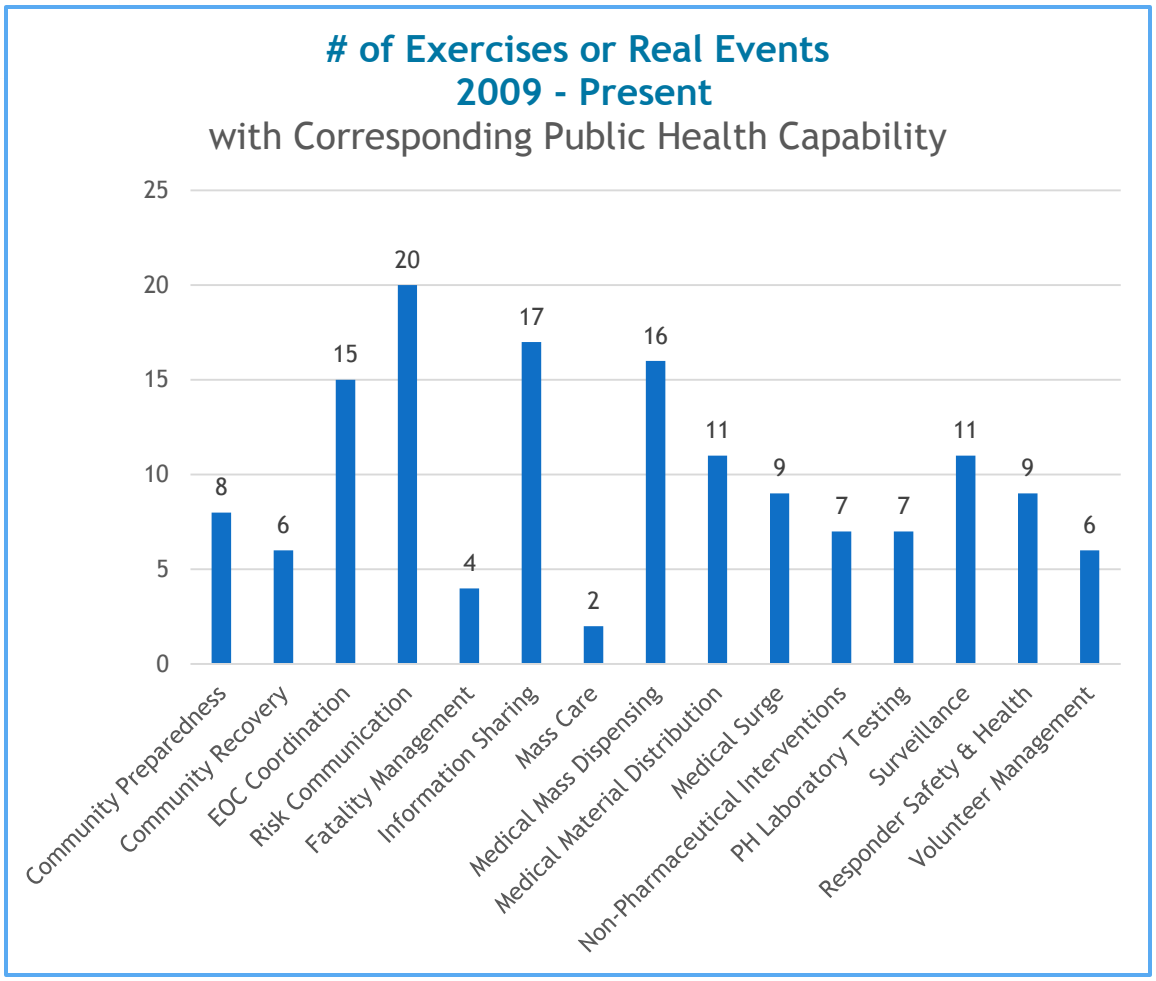
Public Information and Warning
Medical Countermeasures
Medical Materials Management & Distribution
Volunteer Management

SLU Closed POD

Medical Countermeasures
Volunteer Management

CHEMPack

Emergency Operations Center
Public Information and Warning
Surveillance and Epidemiologic Investigation
Responder Safety and Health
Non-Pharmaceutical Interventions


# of Exercises or Real Events
2009 - Present
with Corresponding Public Health Capability
25
20
15
10
5
0
8
6
15
20
4
17
2
16
11
9
7
7
11
9
6
Community Preparedness
Community Recovery
EOC Coordination
Risk Communication
Fatality Management
Information Sharing
Mass Care
Medical Mass Dispensing
Medical Material Distribution
Medical Surge
Non-Pharmaceutical Interventions
PH Laboratory Testing
Surveillance
Responder Safety & Health
Volunteer Management

Technical Reviews

In July 2014, the Centers for Disease Control and Prevention (CDC) implemented a new method of reviewing state and local medical countermeasure operational readiness. The Medical Countermeasure (MCM) Operational Readiness Review (ORR) replaces CDC's technical assistance review (TAR) planning tool, which CDC used successfully for nearly a decade to review medical countermeasure planning at the state and local levels.

CDC's new review process is designed to better measure a jurisdiction's ability to plan and successfully execute any large-scale response requiring distribution and dispensing of medical countermeasures. It builds upon the medical countermeasure planning progress PHEP awardees have made over the years and is intended to identify medical countermeasure response operational capabilities as well as gaps that may require more targeted technical assistance.

The City of St. Louis Department of Health was reviewed for the first time under the CDC's new review tool, the ORR, in January, 2016 and results are still pending. No reviews were conducted during 2014 and 2015 while the new tool was under development.

Prior to the introduction of the ORR, the Emergency Response Program review scores were as follows: